

State of Arizona Exceptional Event Documentation of a High Wind Dust Event PM₁₀ Exceedance on July 29, 2016 in the Maricopa County PM₁₀ Nonattainment Area

Produced by:

Arizona Department of Environmental Quality
Maricopa County Air Quality Department
Maricopa Association of Governments

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July 29, 2016 High Wind Dust Event

(Image source: <http://www.12news.com/weather/monsoon/phoenix-area-cleaning-up-storm-damage/284542242>)

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I. INTRODUCTION

This documentation is being submitted to the Environmental Protection Agency (EPA) to demonstrate that an exceedance of the 24-hour PM₁₀ standard at the Zuni Hills monitor in the Maricopa County PM₁₀ nonattainment area on July 29, 2016 should be excluded from use in determinations of exceedances or violations of the 24-hour PM₁₀ National Ambient Air Quality Standards (NAAQS) as an exceptional event caused by a high wind dust event. This documentation serves to meet the requirements of Clean Air Act Section 319(b) (Air quality monitoring data influenced by exceptional events) and the EPA final rule, *Treatment of Data Influenced by Exceptional Events* (81 FR 68216), as codified in 40 CFR Sections 50.1 and 50.14. Additionally, state and local agencies are in the process of developing a mitigation plan for the Maricopa County PM₁₀ nonattainment area to meet the requirements of 40 CFR Section 51.930. The mitigation plan will be submitted to EPA by September 30, 2018, as required by 40 CFR Section 51.930(b)(3).

Summary of the Exceptional Event

On July 29, 2016, strong to severe evening thunderstorms materialized over south-central Arizona as a result of an active monsoon season weather pattern. The National Weather Service issued a dust storm warning in the Maricopa nonattainment area as a result of the thunderstorm outflows. The warning predicted wind gusts over 40 mph and localized visibilities falling below one quarter of a mile. Two main outflow boundaries generated rapidly forming cells across the nonattainment area. Widespread sustained winds of 40 to 55 mph were reported across the nonattainment area by the National Weather Service along with gusts as high as 70 mph as reported at Sky Harbor Airport. The outflows were fast-moving and associated with heavy rain in some areas.

PM₁₀ concentrations were elevated throughout the evening (7:00 – 10:30 PM) within the Maricopa County nonattainment area in response to the dust storm generated by the thunderstorm outflow winds, but quickly returned to normal levels once the outflows exited the nonattainment area and precipitation followed the outflow boundaries. The largest PM₁₀ concentrations were focused on the northwest side of the nonattainment area where the first main outflow was centered and where recorded precipitation was the least. One monitor (Zuni Hills) located in the northwestern-most portion of the nonattainment area (nearest to the source area of the first main thunderstorm outflow) exceeded the 24-hour PM₁₀ standard as a result of the high wind dust event, as listed in Table 1-1. Source areas identified as contributing to the windblown dust that caused the high and exceeding PM₁₀ concentrations are the northern deserts areas of Maricopa County and to a lesser degree the deserts of Pinal County where the second outflow originated. As the strength of the thunderstorm outflows would normally qualify the high wind event as a “large scale and high-energy” event (focus of a dust storm warning, sustained winds 40 mph or greater, and visibilities less than a half mile), the event does not technically qualify for this designation as only one monitor in the nonattainment area exceeded the PM₁₀ standard. However, the strength of the winds clearly demonstrates that the event was not reasonably controllable or preventable, overwhelming any and all controls on anthropogenic sources that may have contributed to the exceedance.

Table 1-1. PM₁₀ Monitors Affected by the High Wind Dust Event.

Monitor Name	County	Operating Agency	Monitor ID	Exceeding 24-Hour PM ₁₀ Concentration
Zuni Hills	Maricopa	Maricopa County Air Quality Department	04-013-4016	174 µg/m ³

Statutory and Regulatory Requirements

Clean Air Act Section 319(b) defines an exceptional event as an event that:

- (i) affects air quality;
- (ii) is not reasonably controllable or preventable.;
- (iii) is an event caused by human activity that is unlikely to recur at a particular location or a natural event; and
- (iv) is determined by the Administrator through the process established in the regulations promulgated under paragraph (2) [Regulations] to be an exceptional event.

EPA regulation in 40 CFR Section 50.1(j) further defines an exceptional event as:

“...an event(s) and its resulting emissions that affect air quality in such a way that there exists a clear causal relationship between the specific event(s) and the monitored exceedance(s) or violation(s), is not reasonably controllable or preventable, is an event(s) caused by human activity that is unlikely to recur at a particular location or a natural event(s), and is determined by the Administrator in accordance with 40 CFR 50.14 to be an exceptional event. It does not include air pollution relating to source noncompliance. Stagnation of air masses and meteorological inversions do not directly cause pollutant emissions and are not exceptional events. Meteorological events involving high temperatures or lack of precipitation (*i.e.*, severe, extreme or exceptional drought) also do not directly cause pollutant emissions and are not considered exceptional events. However, conditions involving high temperatures or lack of precipitation may promote occurrences of particular types of exceptional events, such as wildfires or high wind events, which do directly cause emissions.”

EPA regulation in 40 CFR Section 50.14(c)(3)(iv) states that a demonstration to justify the exclusion of monitor data as an exceptional event must include:

- (A) A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s);
- (B) A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation;
- (C) Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the requirement at paragraph (c)(3)(iv)(B) [clear causal relationship] of this section. The Administrator shall not require a State to prove a specific percentile point in the distribution of data;
- (D) A demonstration that the event was both not reasonably controllable and not reasonably preventable; and
- (E) A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event.

Additionally, specific regulatory requirements related to demonstrations for high wind dust events are included in 40 CFR Section 50.14(b)(5). Details on how the statutory and regulatory requirements are addressed in this documentation are presented in the bulleted list below:

- Chapter II of this assessment includes a narrative conceptual model that describes the genesis of the high wind dust event and how PM₁₀ emissions from the high wind dust event caused the PM₁₀ exceedance on July 29, 2016 in the Maricopa County nonattainment area.
- Chapter III provides a detailed body of evidence that the event affected air quality through the clear causal relationship between the PM₁₀ emissions from the high wind dust event and the exceedance at the Zuni Hills monitor in the Maricopa County PM₁₀ nonattainment area. Section III also includes an analysis comparing the event-influenced exceeding PM₁₀ concentration at the Zuni Hills monitor to historical PM₁₀ concentrations at the monitor.
- Chapter IV presents evidence that the high wind dust event was a natural event and that the high wind dust event was neither reasonably controllable nor preventable.
- Chapter V includes a summary conclusion of the evidence presented in Chapters II-IV.

Procedural Requirements

This procedural requirements for submitting a demonstration to EPA for an exceptional event are included in 40 CFR Section 50.14(c). The procedural requirements include the schedules and procedures for notifying the public when an event occurs; for providing EPA with the initial notification of a potential exceptional event; and for documenting the public comment process. Specific procedural requirements are presented below:

- 40 CFR Section 50.14(c)(1)(i) – Public notification that event was occurring:

The Arizona Department of Environmental Quality (ADEQ) issued an ensemble air quality forecast for the Greater Phoenix area on July 28, 2016 and a dust control forecast for Maricopa County that discuss the possibility of blowing dust and elevated PM₁₀ concentrations as a result of thunderstorm outflows from the monsoon season weather pattern. The forecast products that were issued on July 28, 2016 are included in Appendix A.

- 40 CFR Section 50.14(c)(2)(i) – Initial notification of potential exceptional event by creating an initial event description and flagging the associated data that have been submitted to the AQS database:

The Maricopa County Air Quality Department (MCAQD) has created an initial event description (high wind dust event) and flagged the associated air quality monitoring data for July 29, 2016 as an exceptional event in AQS. The following monitor has been flagged as exceeding the PM₁₀ standard on July 29, 2016 as a result of a high wind dust event:

Zuni Hills (04-013-4016)

- 40 CFR Section 50.14(c)(2)(i)(A) – Regular communication with the EPA Regional office to identify data that have been potentially influenced by an exceptional event, to determine whether the identified data may affect a regulatory determination and to discuss whether the State should develop and submit an exceptional events demonstration:

ADEQ began initial discussions with EPA about this event on May 18, 2017. ADEQ submitted formal initial notification of the July 29, 2016 high wind dust event to EPA Region IX at that time.

- 40 CFR Section 50.14(c)(2)(i)(B) – For data that may affect an anticipated regulatory determination or where circumstances otherwise compel EPA to prioritize the resulting demonstration, EPA shall respond to the State’s initial notification with a demonstration due date:

EPA did not provide a due date for this demonstration.

- 40 CFR Section 50.14(c)(2)(i)(C) – EPA may waive the initial notification of potential exceptional event process on a case-by-case basis:

EPA did not waive the initial notification of potential exceptional event process.

- 40 CFR Section 50.14(c)(3)(v) – With submission of the demonstration containing the elements in 40 CFR Section 50.14(c)(3)(iv), the State must document that a public comment process was followed, submit any public comments received, and address in the submission to EPA those comments disputing or contradicting factual evidence provided in the demonstration:

ADEQ posted this assessment report on the ADEQ webpage and placed a hardcopy of the report in the ADEQ Records Management Center for public review. ADEQ opened a 30-day public comment period on July 31, 2017. A copy of the public notice certification, along with any comments received and responses to those comments, will be submitted to EPA, consistent with the requirements of 40 CFR Section 50.14(c)(3)(v).

Mitigation Requirements

Per the requirements of 40 CFR Section 51.930(b)(1)(B)(ii), EPA provided written notification in the Federal Register notice for the EPA final rule, *Treatment of Data Influenced by Exceptional Events* (81 FR 68216), that the Maricopa County PM₁₀ nonattainment area is required to develop a mitigation plan for high wind dust events that satisfy the requirements of 40 CFR Section 51.930(b)(2). A high wind dust event mitigation plan for the Maricopa County PM₁₀ nonattainment area is required to be submitted to EPA by September 30, 2018. State and local agencies are in the process of developing the mitigation plan. The documentation for the July 29, 2016 high wind dust event is being submitted to EPA before a mitigation plan for the Maricopa County PM₁₀ nonattainment area is in place as allowed under 40 CFR Section 50.14(b)(9)(ii)(B).

II. CONCEPTUAL MODEL

Geographic Setting and Climate

Geographic Setting

The Maricopa County PM₁₀ nonattainment area is located in the Salt River Valley in south-central Arizona. It lies at a mean elevation of 1,090 feet above mean sea level (msl) in the northeastern part of the Sonoran Desert. Other than the mountains in and around the area, the topography of the area is generally flat. The area is surrounded by the McDowell Mountains (~4,200 ft msl) to the northeast, the foothills of the Bradshaw (~7,900 ft msl) and Mazatzal (~7,900 ft msl) ranges to the north, the White Tank Mountains (~4,500 ft msl) to the west, the Sierra Estrella (~4,450 ft msl) to the southwest, and the Superstition Mountains (~5,000 ft msl) far to the east. Within the area are the Phoenix Mountains (~2,600 ft msl) and South Mountain (~2,600 ft msl). Current development is pushing north, west, and south into Pinal County.

The PM₁₀ nonattainment area contains a fairly dense network of PM₁₀ monitors throughout the area, with a much less dense network of monitors located throughout the rest of the state. Figure 2–1 shows the general geographic setting of the nonattainment area, as well as the locations of PM₁₀ monitors in the nonattainment area and throughout the state.

Figure 2–2 depicts the drainage systems or watersheds for the State of Arizona. Many of the rivers that form Arizona's drainage system are dry for most of the year and, consequently, are sources of silt and fine soils that become suspended and add to regional PM₁₀ loadings during high wind events. Much of this alluvial matter and fine soil is deposited in the low lying areas of central and southern Arizona, with larger depositional areas focused in and around the confluences of dry river channels.

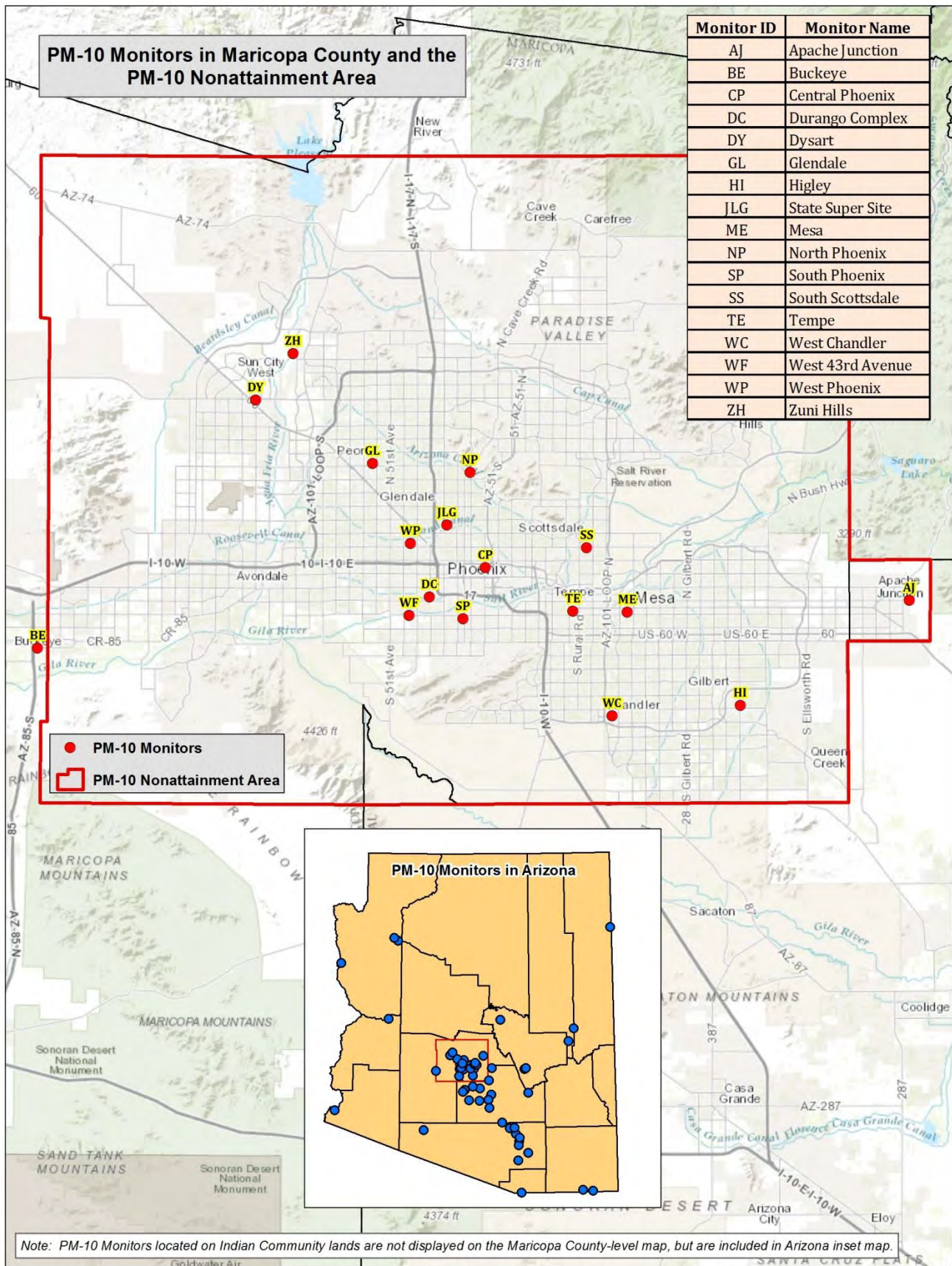


Figure 2-1. Maricopa County PM₁₀ nonattainment area geographic setting and PM₁₀ monitor locations.

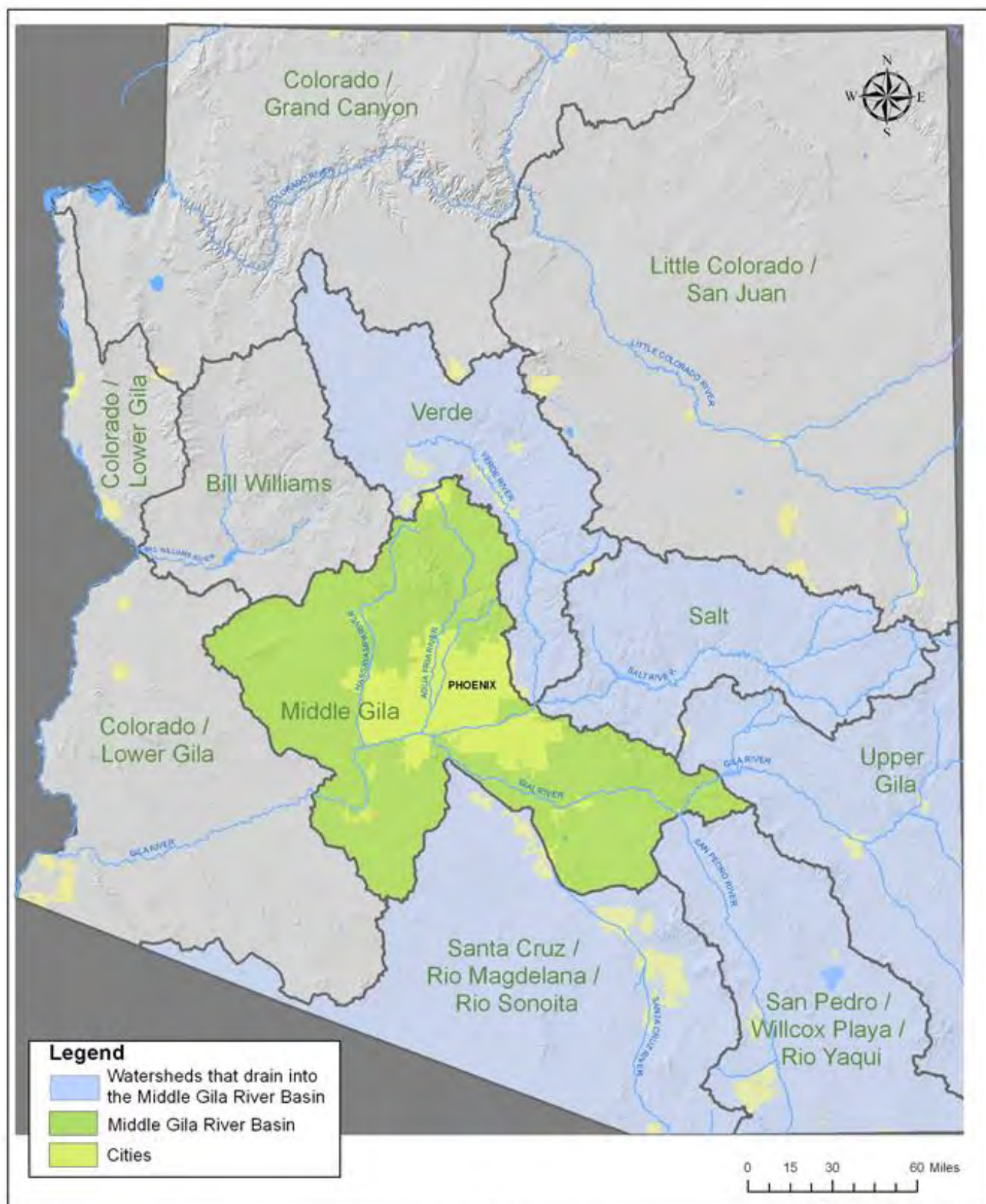


Figure 2-2. Drainage basins of the State of Arizona.

Climate

The Maricopa County PM₁₀ nonattainment area has an arid climate, with very hot summers and temperate winters. The average summer high temperature is among the hottest of any populated area in the United States. The temperature reaches or exceeds 100°F an average of 110 days during the year and highs top 110°F an average of 18 days during the year. The area receives an average of 7.66 inches of rain per year.

Precipitation is sparse during the first part of the summer, but the influx of monsoonal moisture, which generally begins in early July and lasts until mid-September, raises humidity levels and can cause heavy localized precipitation and flooding. Although thunderstorms are possible at any time of the year, they are most common during the monsoon season from July to mid-September as humid air is advected from the Gulf of California, Gulf of Mexico, and large thunderstorm complexes from the Sierra Madre Occidental Mountains in Mexico. This influx in moisture, combined with intense solar heating, often creates a very unstable environment that is ripe for thunderstorm development. These thunderstorms can bring strong winds and blowing dust, large hail, and heavy rain. Dust storms associated with these thunderstorms typically occur in the early part of the monsoon season (July) before soaking rains help keep soil particles bound to one another. However, depending on the amount of precipitation received during the monsoon season, extremely hot temperatures act to dry out the surface quickly, and dust storms can occur at any time. During the December through March period, winter storms moving inland from the Pacific Ocean can bring strong winds, blowing dust and significant rains throughout Arizona. This December – March time period, and July – August time period are typically the wettest parts of the year. Meanwhile, a distinct dry season occurs during the period April through June for the nonattainment area and the rest of Arizona. While these weather patterns describe the general climatology for the nonattainment area over a long period of time, the area and the entire state of Arizona is also prone to a high degree of variability in these weather patterns from year to year.

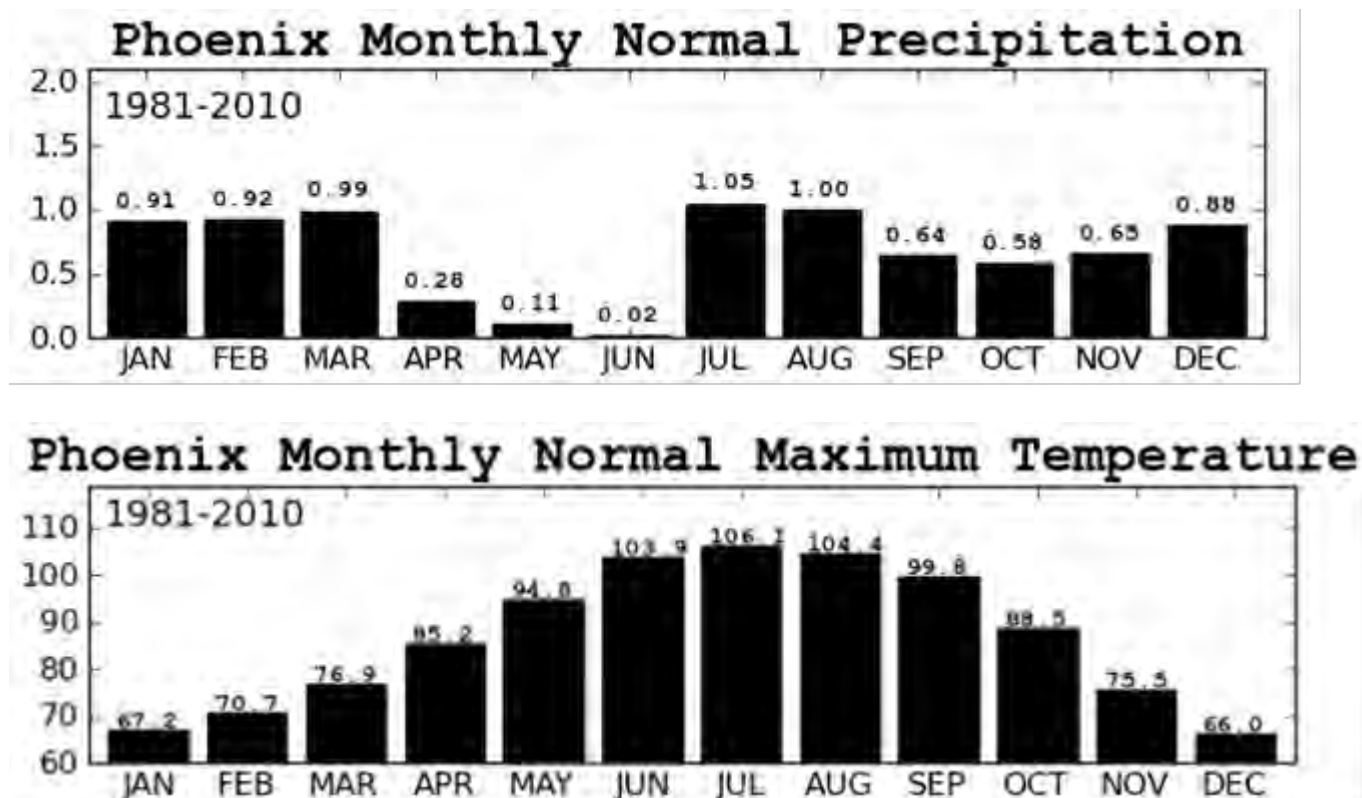


Figure 2-3 Phoenix monthly precipitation (top) and maximum temperature (bottom) climatology (source: National Weather Service).

Monsoon Season High Wind Dust Event Summary

The North American Monsoon is a shift in wind patterns in the summer which occurs as Mexico and the southwest U.S. warm under intense solar heating. As this happens, low level moisture is transported primarily from the Gulf of California and eastern Pacific Ocean into the southwestern U.S. Mid and upper level moisture is also transported into the region, mainly from the Gulf of Mexico by easterly winds aloft. This combination causes a distinct rainy season over large portions of western North America, which develops rather quickly and sometimes dramatically. There are usually distinct “burst” periods of heavy rain during the monsoon, and “break” periods with little or no rain. Even during active monsoon periods, some areas can go without receiving any significant precipitation while other nearby areas experience heavy rains and flooding.

In addition to bringing precipitation, active thunderstorms can produce downbursts, or sometimes more concentrated and severe microbursts, which are rapidly descending bursts of air spreading away from the thunderstorm clouds. These downward bursts of air hit the ground and then disperse away from the storms as areas of outflow. These outflow boundaries from the thunderstorms can generate large walls of dust, sometimes called haboobs, and transport that dust for long distances from the initiating thunderstorms (see Figure 2–4).

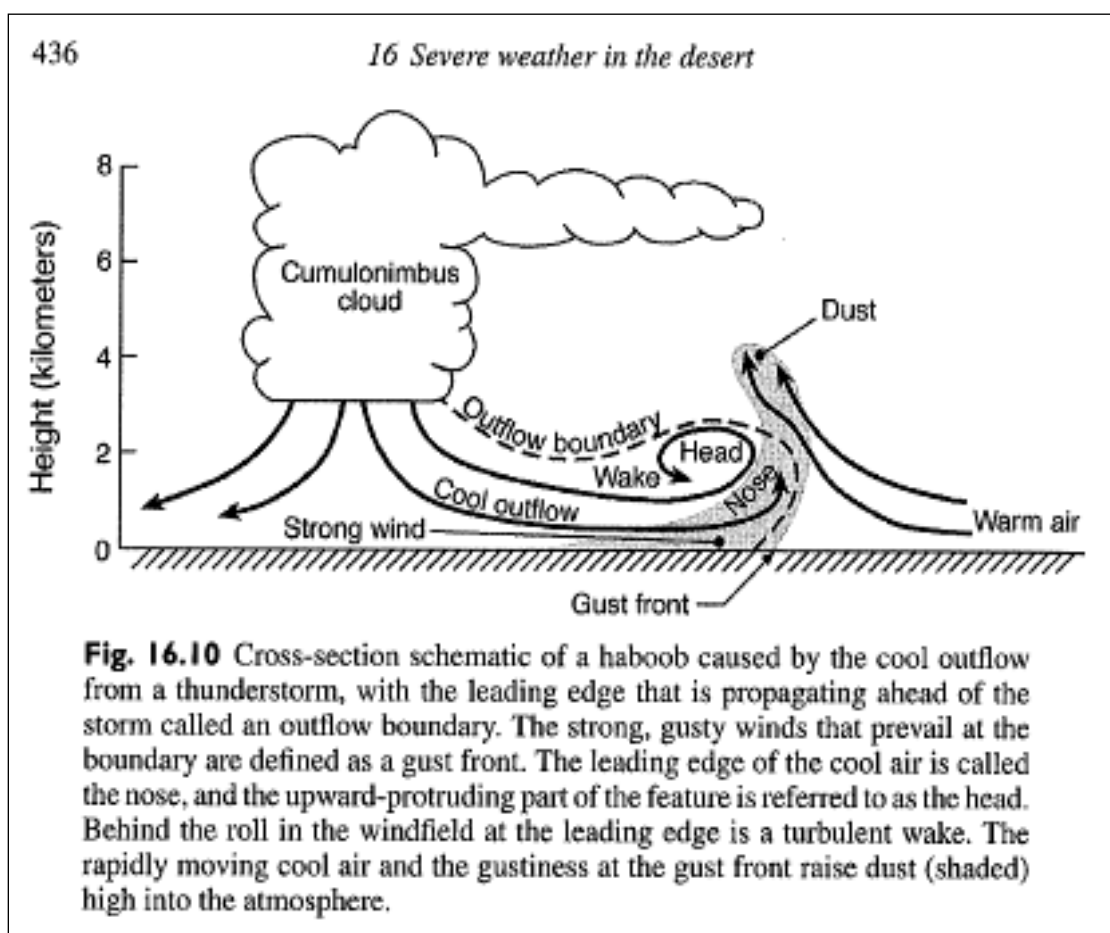


Figure 2-4. Cross-section of a thunderstorm creating an outflow boundary and haboob (Desert Meteorology. Thomas T. Warner. 2004.)

According to the National Weather Service (NWS), strong to severe evening thunderstorms materialized on July 29, 2016 over south-central Arizona as a result of an active monsoon season weather pattern. Two main outflows, one from the north-northeast and the other from the southeast, brought windblown dust to the Maricopa County PM₁₀ nonattainment area on fast-moving winds. In response, The NWS issued a dust storm warning for northwest Maricopa County, the Greater Phoenix area, and northwest and north central Pinal County at 7:43 PM and at 8:19 PM. The dust storm warnings predicted wind gusts over 40 mph and localized visibilities falling below one quarter of a mile.

Widespread sustained winds of 40 to 55 mph were reported across the nonattainment area by the National Weather Service along with gusts of 70 mph as reported at the Sky Harbor Airport. Additionally, at 7:41 PM, a trained NWS spotter reported a dust storm with visibility less than one eighth of a mile approximately within four miles of the exceeding Zuni Hills monitor (See Appendix B). This blowing dust moved quickly through the nonattainment area with the thunderstorm outflows, raising PM₁₀ concentrations at monitors in the nonattainment area and in Pinal County. The fast-moving nature and heavy rain that followed the thunderstorm outflows prevented many nonattainment area monitors from otherwise exceeding the PM₁₀ standard.

PM₁₀ concentrations in the nonattainment area from the outflow-generated windblown dust were densest at the exceeding Zuni Hills monitor (located closest to the first main outflow boundary), peaking at 7:25 PM with an extraordinary five-minute concentration of 7,651 $\mu\text{g}/\text{m}^3$. Concentrations were generally highest on the northwest side of the nonattainment area where the first outflow was located and the least amount of precipitation was recorded, significantly impacting the Zuni Hills, Dysart and Buckeye monitors. The Zuni Hills monitor was affected by the second main outflow boundary as well, recording a second five-minute concentration peak of 836 $\mu\text{g}/\text{m}^3$ at 9:10 PM.

The second outflow originated in Pinal County and caused exceedances at Pinal County monitors and affected concentrations throughout the Maricopa nonattainment area, but did not lead to exceedances in the nonattainment area as the outflow was fast-moving and generally followed by significant rain. Concentrations at the affected nonattainment area monitors quickly returned to normal after the thunderstorm outflows passed over the monitors. The first main thunderstorm outflow, which was largely responsible for the exceedance at the Zuni Hills monitor, generated sustained winds as high as 48 mph and gusts as high as 68 mph as recorded at the Humboldt Mountain monitor near the area where the first outflow boundary originated. As stated above, NWS text reports of the event stated widespread sustained winds of 40 to 55 mph and gusts as high as 70 mph. Visibility readings in synch with the passage of the dust storm outflows were reported to be as low as zero miles in Pinal County and one eighth of a mile in Maricopa County by the NWS.

The intensity of the thunderstorm outflows would normally qualify the high wind event as a “large scale and high-energy” event (focus of a dust storm warning, sustained winds 40 mph or greater, and visibilities less than a half mile), but the event does not technically qualify for this designation as only one monitor in the nonattainment area exceeded the PM₁₀ standard (largely because of the fast-moving nature of the outflows and the precipitation which followed in many areas). However, the strength of the winds (sustained winds easily over 25 mph) clearly demonstrates that the event was not reasonably controllable or preventable, overwhelming any and all controls on any possible anthropogenic source that may have contributed to the exceedance.

As seen in Figure 2–5, moderate drought conditions throughout Maricopa and Pinal counties likely exacerbated the amount of dust the thunderstorm outflow was able to entrain. Significant precipitation associated with the thunderstorm outflows were recorded at many PM₁₀ nonattainment area NWS stations after the dust storm had passed through the nonattainment area.

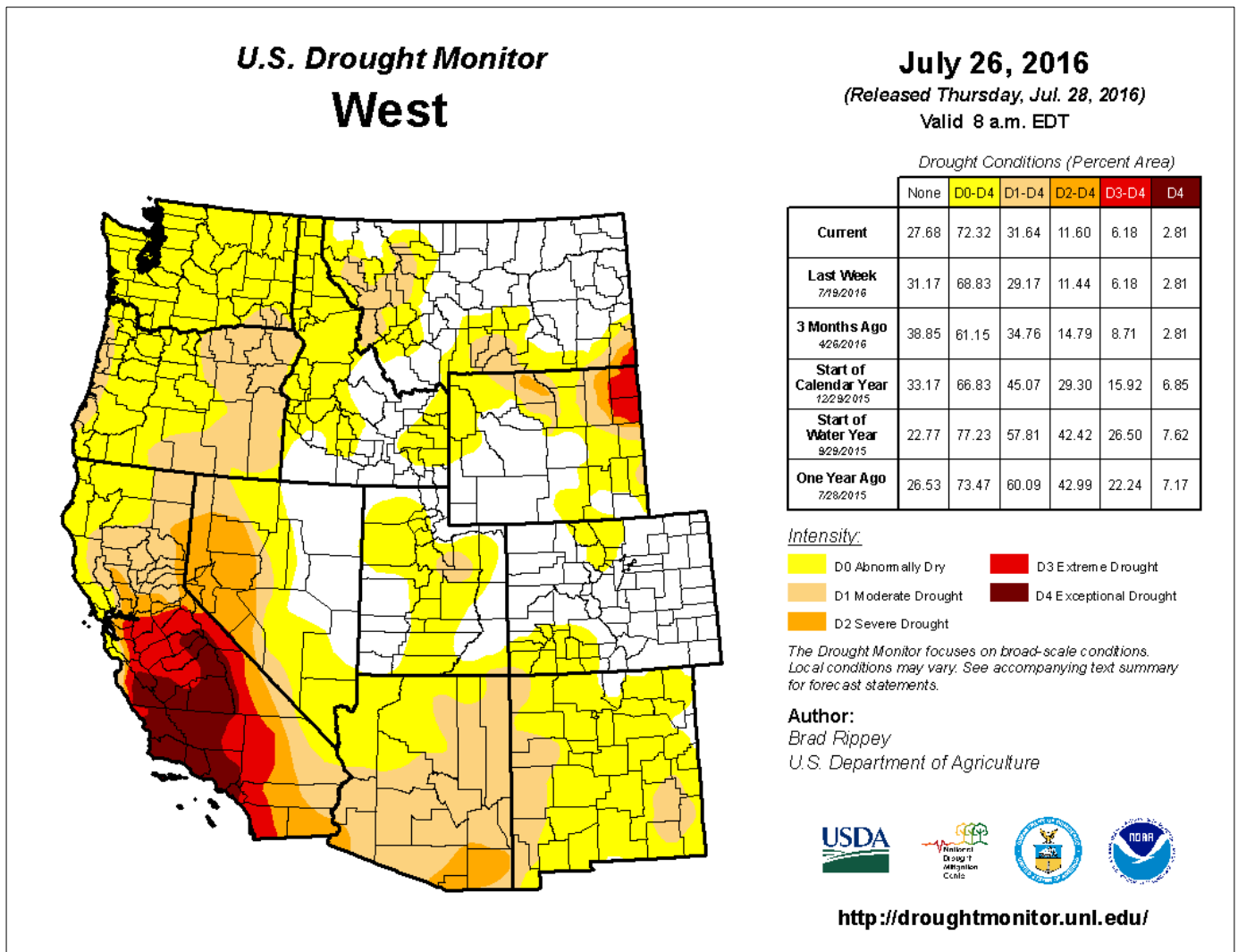


Figure 2-5. Western states drought monitor as of July 26, 2016.

As a summary of the PM₁₀ concentrations during the event, Table 2–1 contains PM₁₀ concentration data at Maricopa County and nonattainment area monitors from July 22 – August 5, 2016, indicating the high levels of PM₁₀ seen on July 29, 2016 as compared to the prior and following week. Figure 2–6 displays those same 24-hour average PM₁₀ concentrations while Figure 2–7 contains the diurnal pattern of PM₁₀ at the Maricopa County and PM₁₀ nonattainment area monitors on July 29, 2016. Lastly, Figure 2–8 displays hourly average PM₁₀ concentrations, maximum hourly 5-minute wind speeds, and maximum hourly gusts as recorded at the exceeding Zuni Hills monitor.

Table 2-1. 24-Hour Average PM₁₀ Concentrations (µg/m³) at Maricopa County and PM₁₀ Nonattainment Area Monitors on July 22-August 5, 2016.

Monitor	July 22	July 23	July 24	July 25	July 26	July 27	July 28	July 29	July 30	July 31	Aug 1	Aug 2	Aug 3	Aug 4	Aug 5
Apache Junction	37	87	52	26	38	34	24	48	20	17	19	9	10	13	9
Buckeye	69	46	45	32	66	44	36	37	39	24	29	22	21	24	26
Central Phoenix	98	39	33	26	29	78	45	50	27	17	76	15	18	18	15
Durango Complex	80	29	21	20	23	37	33	32	18	10	35	12	16	13	13
Dysart	113	35	34	24	31	38	38	115	48	25	72	21	16	22	11
Glendale	125	23	25	17	18	25	38	35	25	12	57	10	10	15	6
JLG Supersite	91	31	29	22	26	65	35	47	26	16	69	20	17	18	15
Mesa	97	54	24	18	20	48	20	72	16	11	34	9	12	12	9
North Phoenix	65	21	19	16	14	30	44	33	20	12	50	12	12	12	12
South Phoenix	72	24	21	20	20	NA	NA	42	15	9	NA	NA	NA	NA	NA
South Scottsdale	99	56	34	26	33	61	30	43	24	14	54	15	13	15	14
Tempe	66	36	20	18	18	39	25	47	15	8	41	6	9	9	8
West 43rd Avenue	104	46	37	32	40	58	51	62	27	19	50	23	27	21	25
West Chandler	96	91	43	23	34	46	26	60	21	17	46	14	15	14	13
West Phoenix	91	26	23	20	19	27	34	45	22	12	48	13	14	12	11
Zuni Hills	140	36	34	25	27	34	40	174	42	38	70	16	17	16	10

Monitoring Data Notes: The Buckeye monitor shut down when the during the time period when the dust storm reached the monitor, invalidating data during the hours of 8:00 PM to 12:00 AM on July 29, 2016. If the monitor had been operating it is likely the monitor would have been very near an exceedance value based upon available 5-minute PM₁₀ before the monitor shut down.

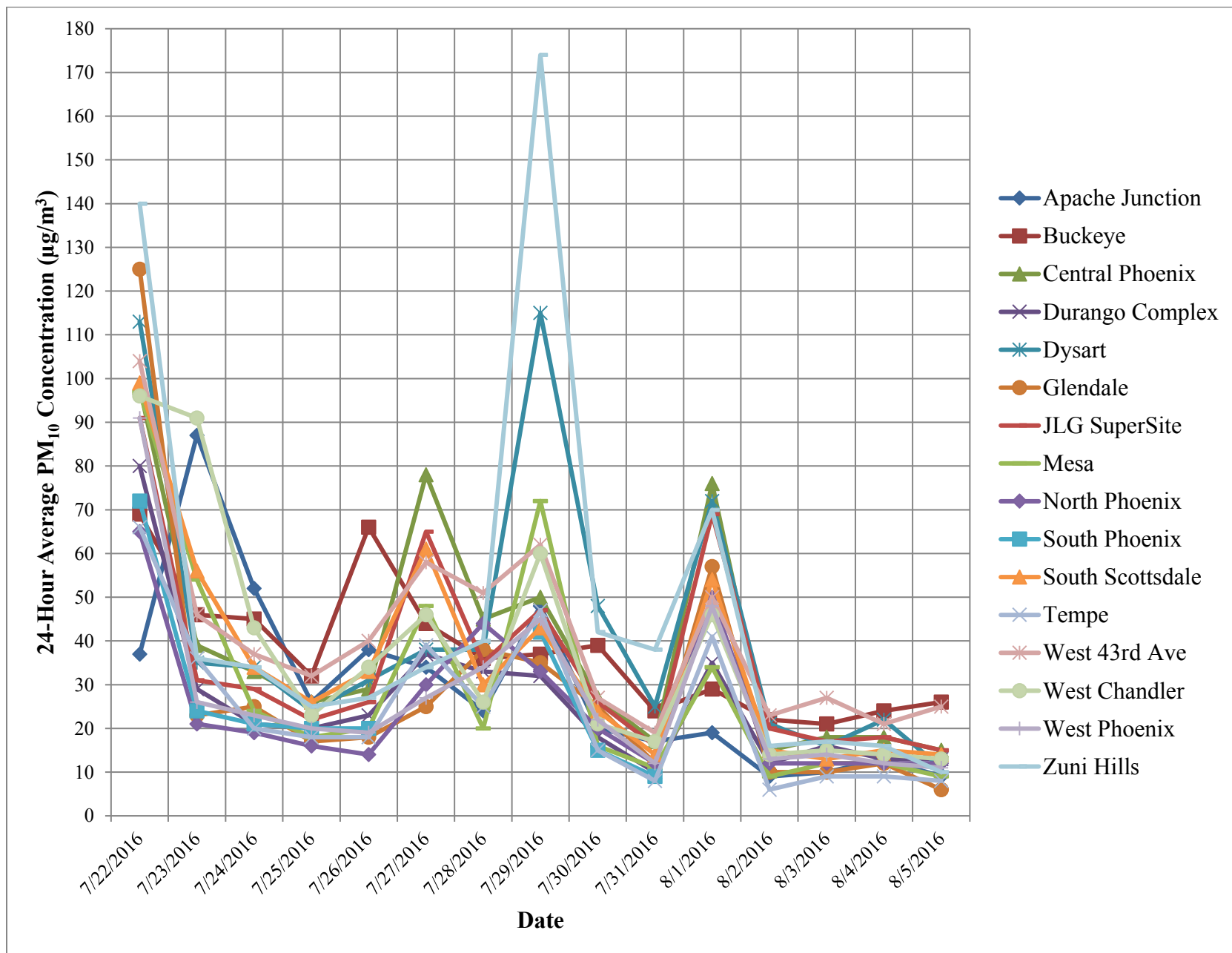


Figure 2-6. 24-hour average PM₁₀ concentrations (µg/m³) at Maricopa County and nonattainment area monitors on July 22-August 5, 2016.

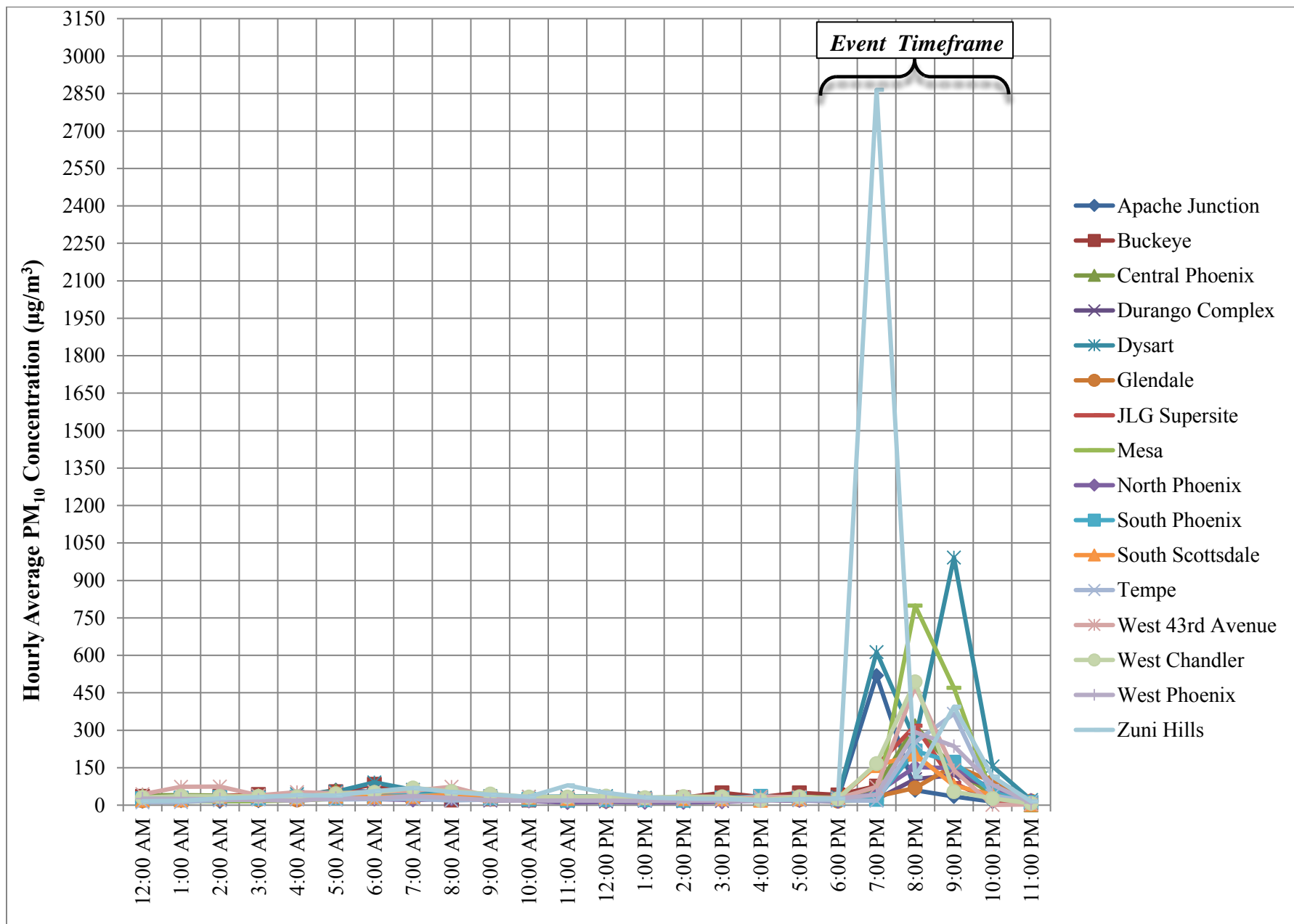


Figure 2-7. Diurnal profile of monitors on July 29, 2016.

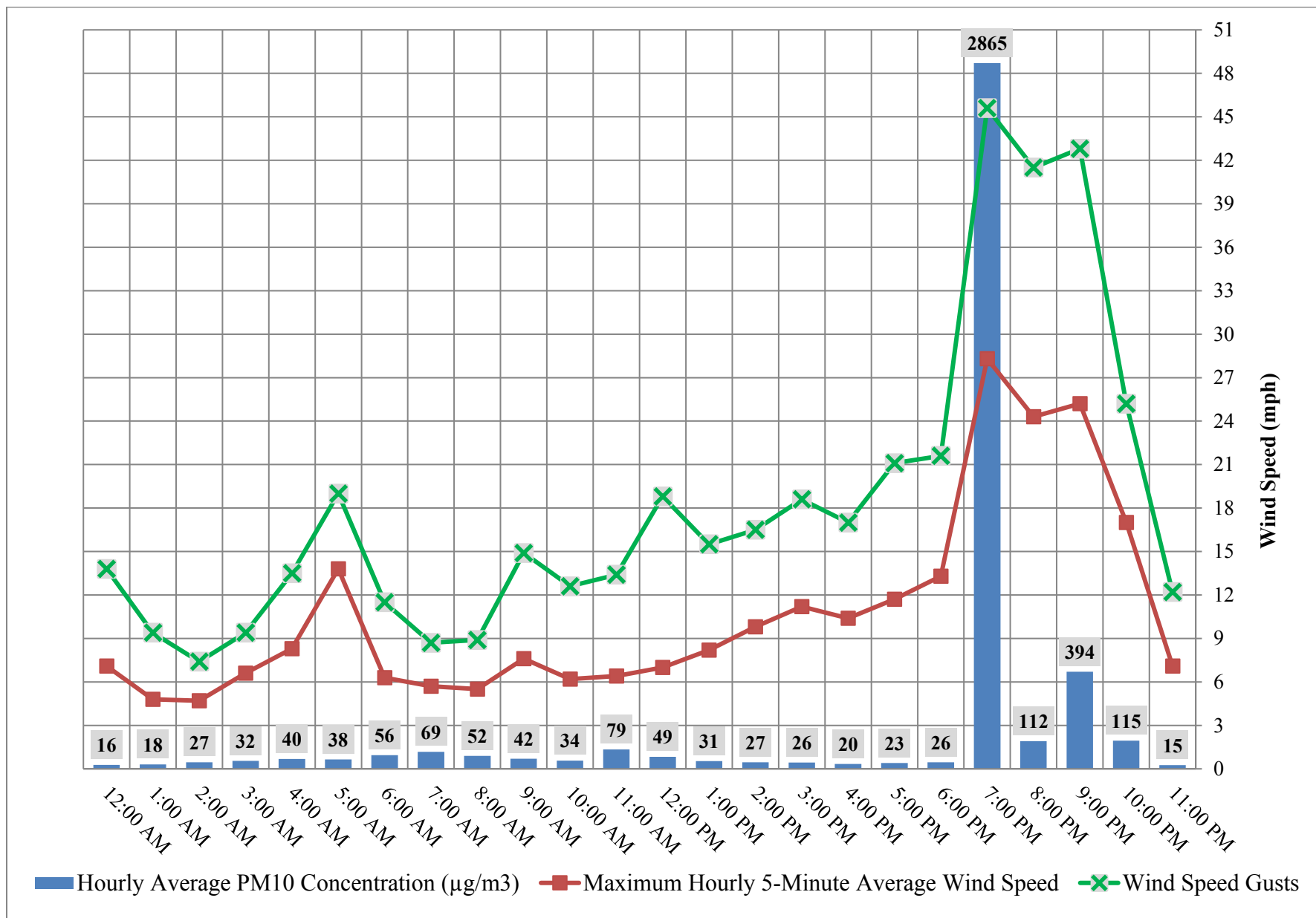


Figure 2-8. Hourly average PM₁₀ concentrations, maximum hourly 5-minute average wind speeds, and maximum hourly gusts as recorded at the exceeding Zuni Hills monitor.

III. CLEAR CAUSAL RELATIONSHIP

Introduction

One of the core statutory elements that must be addressed to exclude a monitored exceedance or violation caused by an exceptional event is a demonstration that the exceptional event “affected air quality in such a way that there exists a clear causal relationship between the event and the monitored exceedance or violation.” The requirement to include this demonstration is codified in 40 CFR Section 50.14(c)(3)(iv)(B). To support the clear causal relationship requirements in 40 CFR Section 50.14(c)(3)(iv)(B), analyses comparing the claimed event-influenced concentration to concentrations at the same monitoring site at other times are required as stated in 40 CFR Section 50.14(c)(3)(iv)(C).

Additionally, specific to high wind dust events, the preamble to the revised exceptional events rule states that “EPA expects air agencies to provide relevant wind data...showing how the observed sustained wind speed compares to the established high wind threshold and demonstrates a relationship between the sustained wind speeds and measured PM concentrations at a particular monitoring location”. Demonstrations covering all of the required elements of a clear causal relationship are presented in the sections below.

Comparison of High Wind Dust Event Concentrations with Historical Concentrations

In Table 2 of the preamble to the revised exceptional events rule, EPA includes as guidance seven categories of “historical concentration evidence” that should be addressed in order to meet the requirement in 40 CFR Section 50.14(c)(3)(iv)(C) to provide analyses comparing the claimed event-influenced concentration to concentrations at the same monitoring site at other times. The seven categories listed by EPA and where they are addressed in this documentation are listed below:

1. Compare the concentrations on the claimed event day with past historical data (included in Figure 3–1).
2. Demonstrate spatial and/or temporal variability of the pollutant of interest in the area (included in Figures 3–3 through 3–16 and Figure 2-6).
3. Determine percentile ranking: 99th percentile (based upon five years of data, July 29, 2011 – July 29, 2016).
4. Plot annual time series to show the range of “normal” values (included in Figure 3–1).
5. Identify all “high” values in all plots (included in Figure 3–1).
6. Identify historical trends (optional, included in Figure 3–1).
7. Identify diurnal or seasonal patterns (included in Figures 3–1 and 3–2).

The bulk of the seven categories listed above are addressed in Figure 3–1. Figure 3–1 includes all 24-hour average PM₁₀ concentrations at the exceeding Zuni Hills monitor from January 1, 2011 through December 31, 2016. This period includes the most recent five calendar years of concentration data at the exceeding monitoring site, as recommended by EPA in the preamble to the revised exceptional events rule. Within the time period presented, Figure 3–1 identifies all days that have been flagged as high wind dust events (including the concurrence status of those days by EPA) and all exceedance days.

All exceedances in Figure 3–1 have been identified as high wind dust events. Figure 3–1 generally indicates that high wind dust events normally occur in spring and summer (when dry cold fronts and the summer

monsoon season are most active), but may occur at any time. The high wind dust events are relatively rare occurring on 8 days out of 2,192, or 0.3% of the time. The specific percentile ranking of this high wind dust event 24-hour average PM₁₀ concentration is in the 99th percentile, based upon five years of data (July 29, 2011 – July 29, 2016).

While not specifically indicated in Figure 3–1, it is important to note that some of the other high, but not exceeding PM₁₀ concentrations (75-150 µg/m³) at the Zuni Hills monitor, occurred on days when high wind dust events nearly caused an exceedance, or on days when high wind dust events caused exceedances at other monitors in the Maricopa County PM₁₀ nonattainment area. Because of the vast size of the nonattainment area, it is rare that a high wind dust event will cause all monitors within the nonattainment area to exceed the PM₁₀ standard. As seen in this high wind dust event, PM₁₀ concentrations were elevated at all nonattainment area monitors within the path of the thunderstorm outflow, particularly at the western nonattainment area monitors (e.g., Dysart monitor at 115 µg/m³), but only the Zuni Hills monitor exceeded on July 29, 2016.

Figure 3–1 also includes a linear trend line of the 24-hour average PM₁₀ concentration data at the Zuni Hills monitor. This trend line is generally flat based upon data from January 1, 2011 to December 31, 2016. While the trend line represents an average of concentration data that can vary significantly from day to day, the trend line does indicate that overall PM₁₀ concentrations at the Zuni Hills monitor have been steady through time, despite an increase in population, employment and vehicle traffic throughout the nonattainment area. This is not unexpected given that the Zuni Hills monitor is located in a suburban/semi-rural setting, where PM₁₀ concentrations are generally low and well controlled. This location is also near natural, undeveloped desert areas, making it susceptible to windblown dust that originates in the desert areas north and west of the nonattainment area.

As can be seen in Figure 3–1, there is not a distinct seasonal pattern for PM₁₀, but rather concentrations can vary daily in all seasons. In general terms, wintertime inversion conditions can elevate PM₁₀ on stagnant days in the winter months, and elevated winds particularly during the monsoon season produce the highest overall PM₁₀ concentrations. However, these meteorological conditions are not constant enough to create a definite “season” when PM₁₀ is elevated or suppressed.

Figure 3–2 displays the average diurnal patterns of PM₁₀ as observed over 5 years from January 1, 2011 through December 31, 2015 at the Zuni Hills monitor. The figure includes annual hourly average concentrations, average hourly concentrations in July (the month the event occurred), and the diurnal pattern observed on the event day (July 29, 2016). Hourly PM₁₀ concentrations that were flagged in AQS as being the result of an exceptional event have been removed from the averages. As can be seen in the Figure 3–2, there is little difference between the annual hourly averages and the hourly averages in the month of July over the 5 year period. Diurnal emissions on the high wind dust event day (July 29, 2016) were very similar to the annual and July averages, except during the hours when high winds were present (6pm to 10pm), providing evidence that no unusual anthropogenic activity was occurring around the exceeding Zuni Hills monitor on the high wind dust event day (i.e., no elevated hourly PM₁₀ concentrations during non-windy conditions on the event day as compared to historical hourly averages).

In addition to the data presented in Figures 3–1 and 3–2, data in Figure 2–6 displays the 24-hour average PM₁₀ concentrations at all nonattainment area monitors a week before and after the high wind dust event on July 29, 2016. The peaks seen throughout the week before and after the exceedance day are also due to monsoon season activity, although no other days exceeded during this time frame. The Zuni Hills monitor experienced the highest increase in PM₁₀ concentrations on July 29, 2016 (in comparison to other nonattainment area monitors) due to being located near the center of the windblown dust from the first thunderstorm outflow.

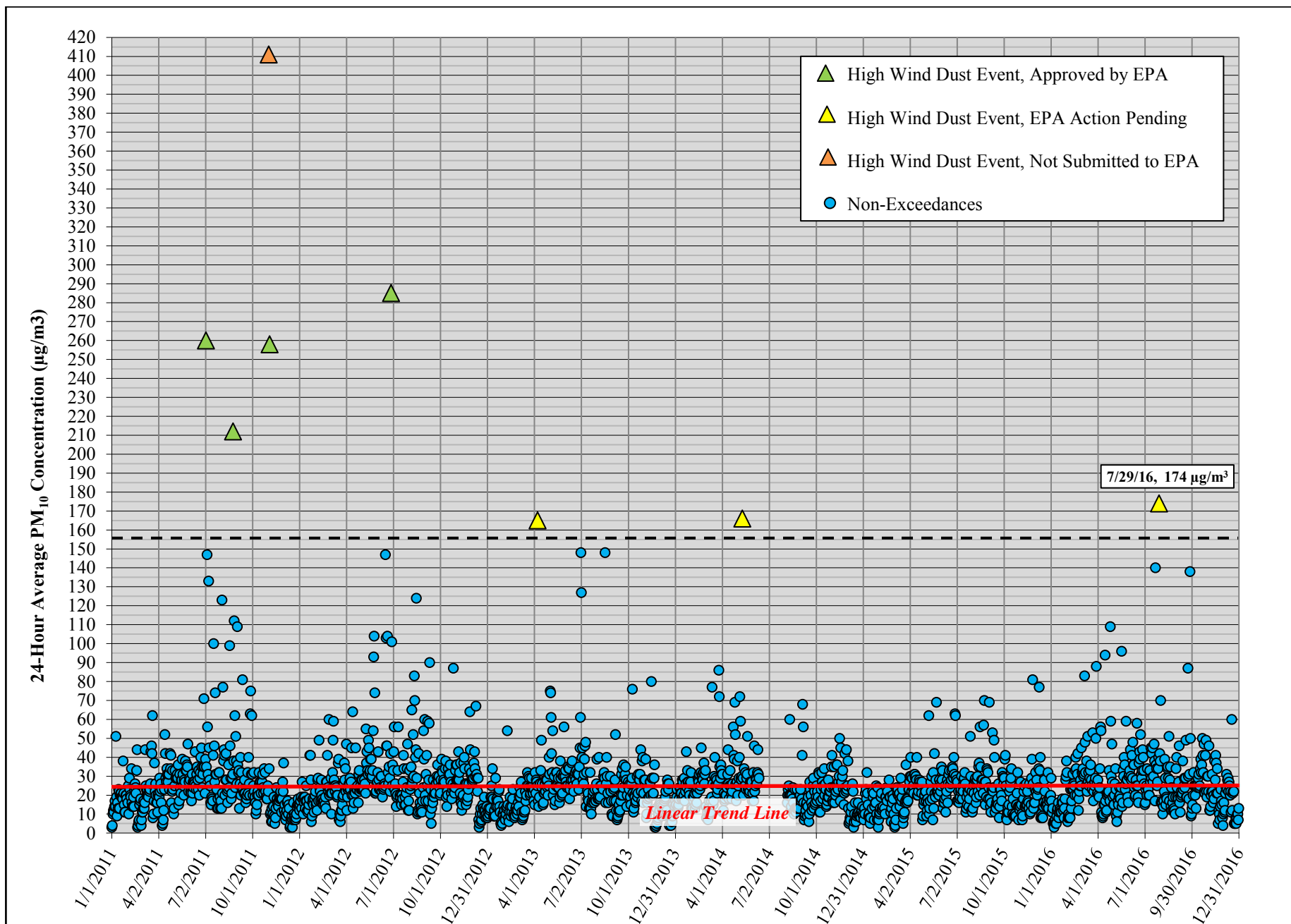


Figure 3-1. Plot of 24-hour average PM₁₀ concentrations at the Zuni Hills monitor, January 2011 – December 2016.

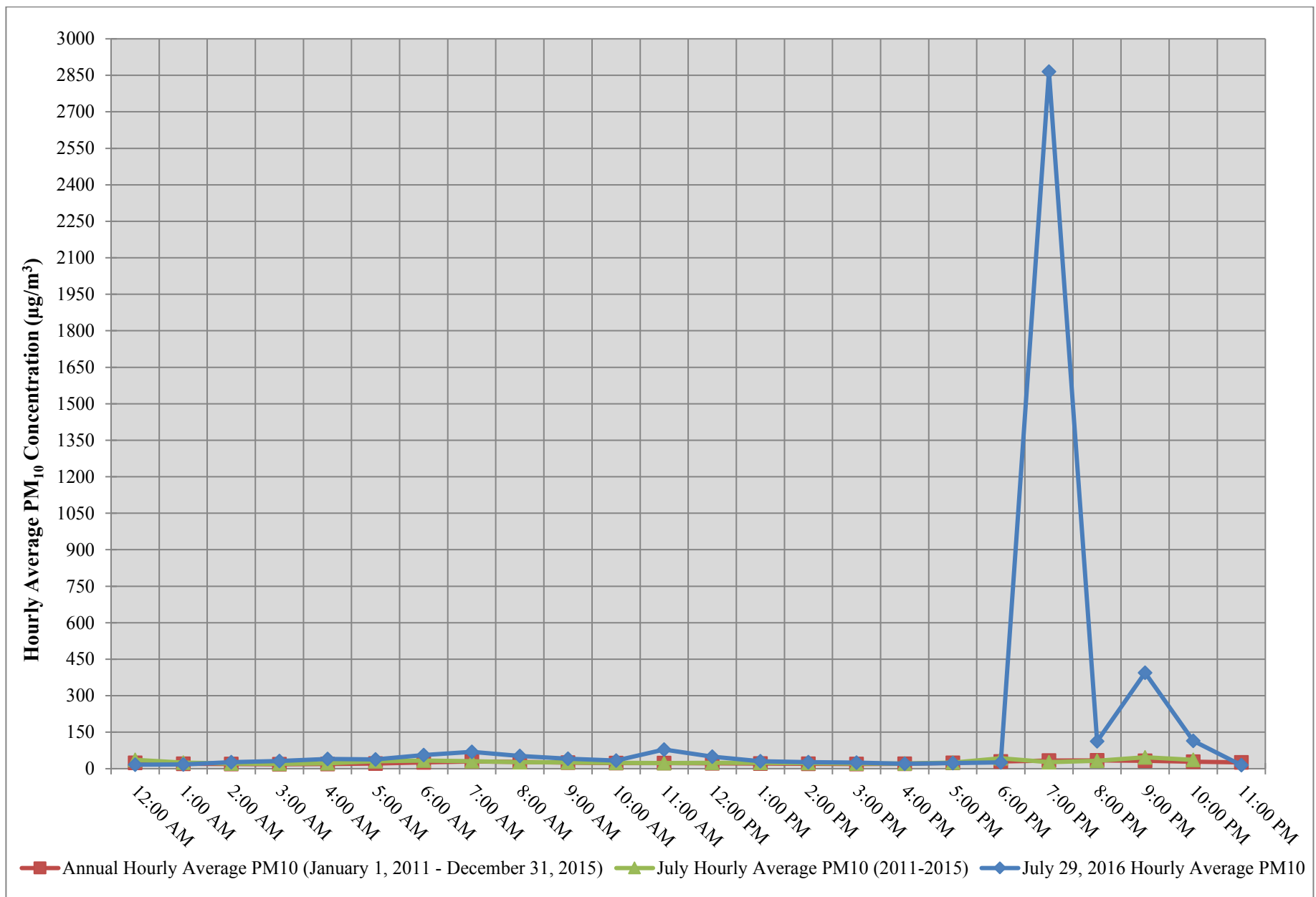


Figure 3-2. Plot of annual hourly average PM₁₀ concentrations (1/1/2011 – 12/31/2015), hourly average PM₁₀ concentrations in July (2011 – 2015), and diurnal PM₁₀ concentrations at the Zuni Hills monitor on the July 29, 2016 high wind dust event day.

Chronological and Spatial Presentation of Wind, Visibility, and PM₁₀ Concentration Data During the High Wind Dust Event in the Maricopa County PM₁₀ Nonattainment Area

In addition to the analyses focused on comparison of the high wind dust event PM₁₀ concentration to historical concentrations, Figure 3–3 through 3–14 display the chronological and spatial distribution of wind, visibility and PM₁₀ concentration data throughout the nonattainment area in mapped form. The figures establish a clear causal relationship between elevated PM₁₀ concentrations, elevated wind speeds and reduced visibility in the nonattainment area. The figures also establish the transport of PM₁₀ across the nonattainment area with the thunderstorm outflow winds.

PM₁₀ concentrations in the figures were highest at the exceeding Zuni Hills monitor when wind speeds were also at their highest. In 40 CFR Section 50.14(b)(5)(iii), EPA establishes a default high wind threshold of a sustained wind of 25 mph, as the wind speed necessary to entrain significant amounts of dust from undisturbed, natural areas, as well as disturbed, anthropogenic source areas that are subject to reasonable controls. Sustained winds, as represented in the figures, were above 25 mph at multiple locations throughout the nonattainment and at the exceeding Zuni Hills monitor, indicating that reasonable controls on anthropogenic sources of windblown dust were overwhelmed and that emissions of dust from natural desert areas would be expected. In summary, the figures make it clear that without the high wind dust event caused by the thunderstorm outflow, there would have been no exceedance at the Zuni Hills monitor.

The data displayed in the following figures were gathered from five data sources. All available meteorological and air quality data were used in order to present the most complete story of the event. Table 3–1 displays the types of data used from each agency in creating the maps. Each map in the figures represents the chronological and spatial distribution of wind, visibility and PM₁₀ concentration in a 30-minute period. The figures start with the 6:00-6:30 PM period and end with the 11:30 PM-12:00 AM period, covering the arrival and passing of the thunderstorm outflow generated windblown dust across the Maricopa County PM₁₀ nonattainment area.

Table 3-1. Data Sets Used in the Creation of Chronological and Spatial Maps.

Agency	Data Sets
Arizona Department of Environmental Quality (ADEQ)	Hourly PM ₁₀ Concentrations, Wind Speed, Wind Direction and Wind Gusts
Arizona Meteorological Network (AZMET)	Hourly Wind Speed, Wind Direction and Wind Gusts
Maricopa County Air Quality Department (MCAQD)	5-Minute PM ₁₀ Concentrations, 5-Minute Wind Speed and Wind Direction, and Maximum Hourly Wind Gusts
Pinal County Air Quality Control District (PCAQCD)	5-Minute and Hourly PM ₁₀ Concentrations, 5-Minute and Hourly Wind Speed, Wind Direction and Wind Gusts
National Weather Service (NWS)	Point in Time Wind Speed, Wind Direction, Wind Gusts, Visibility, and Radial Velocity Radar

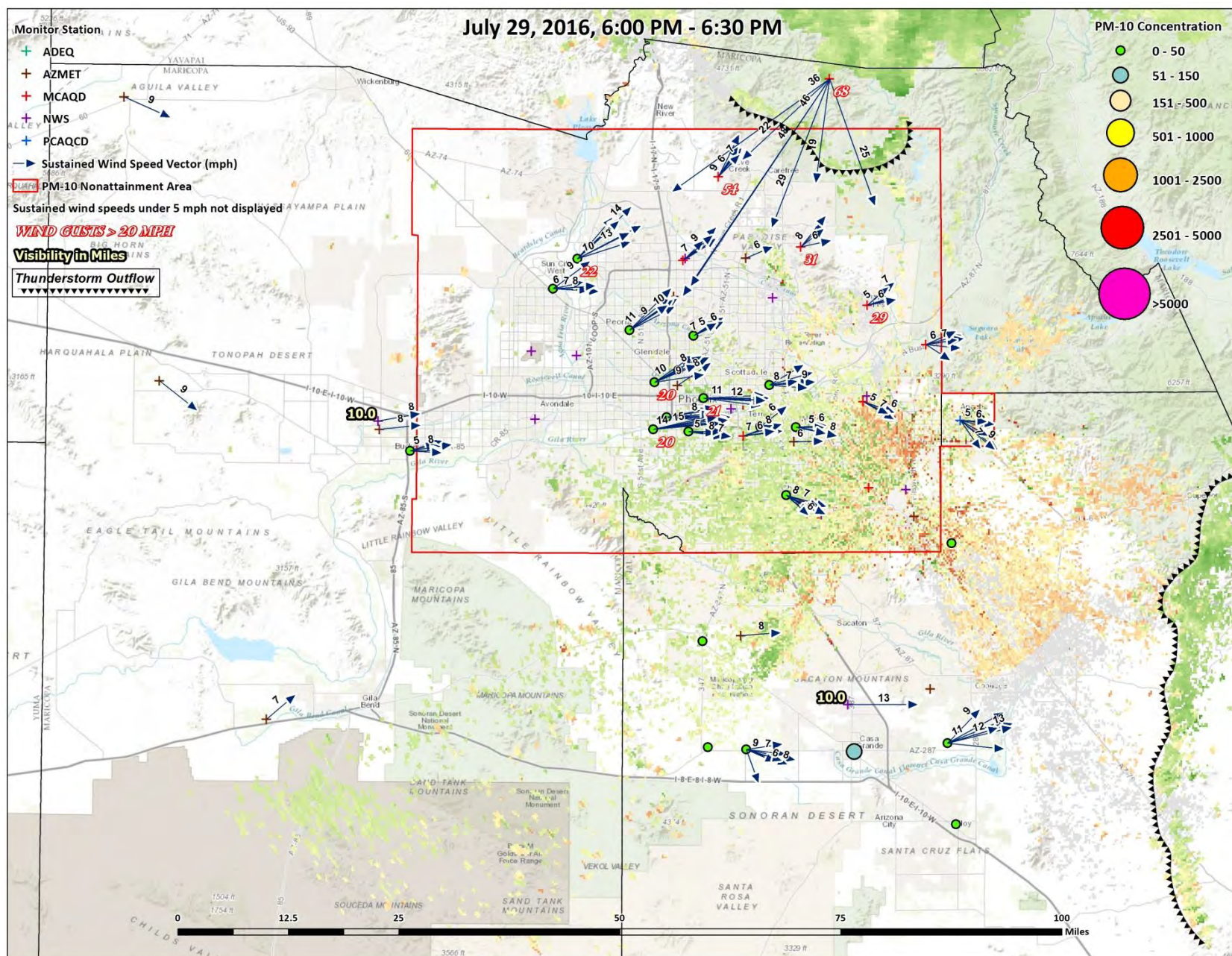


Figure 3-3. July 29, 2016, 6:00 PM – 6:30 PM.

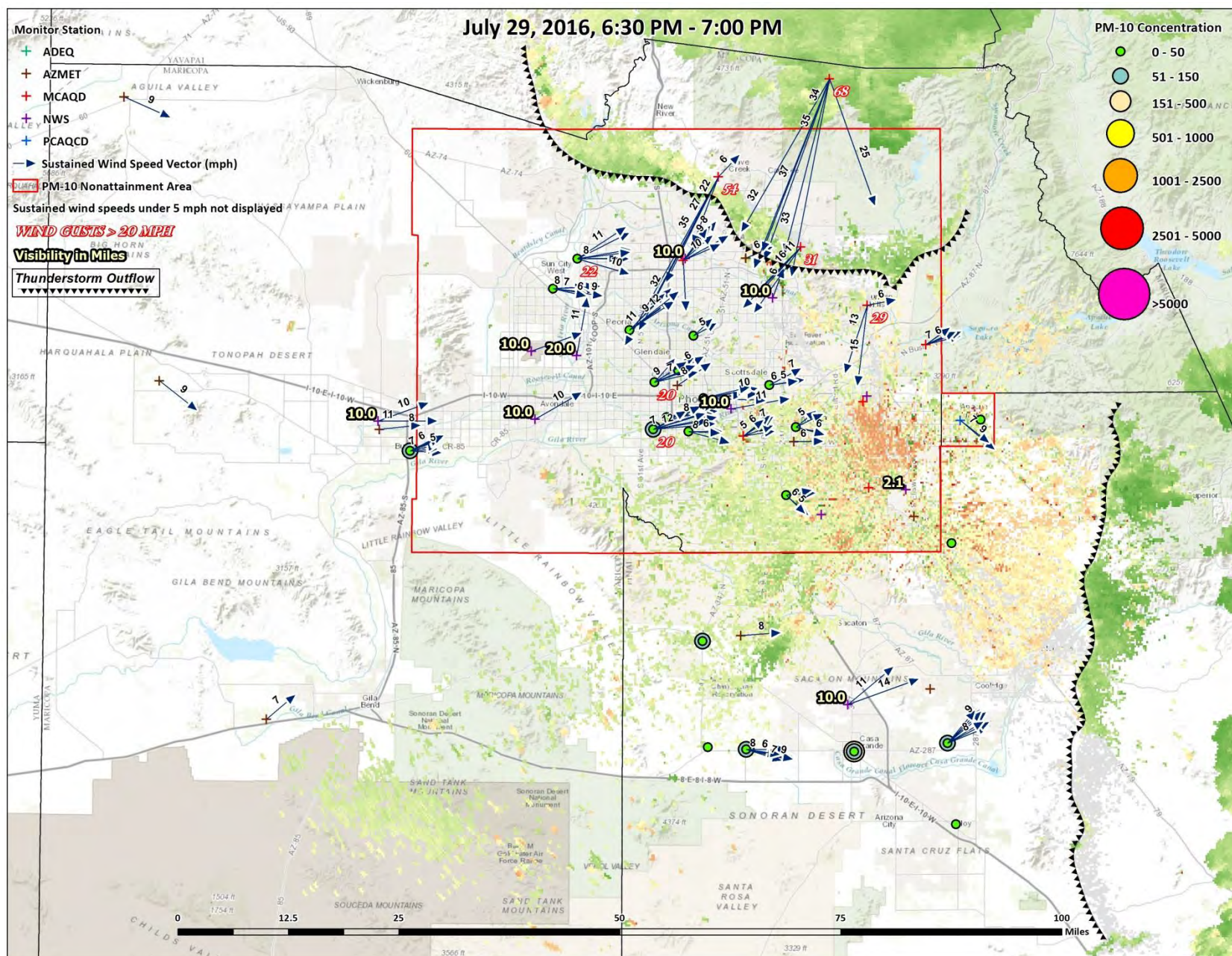


Figure 3-4. July 29, 2016, 6:30 PM – 7:00 PM.

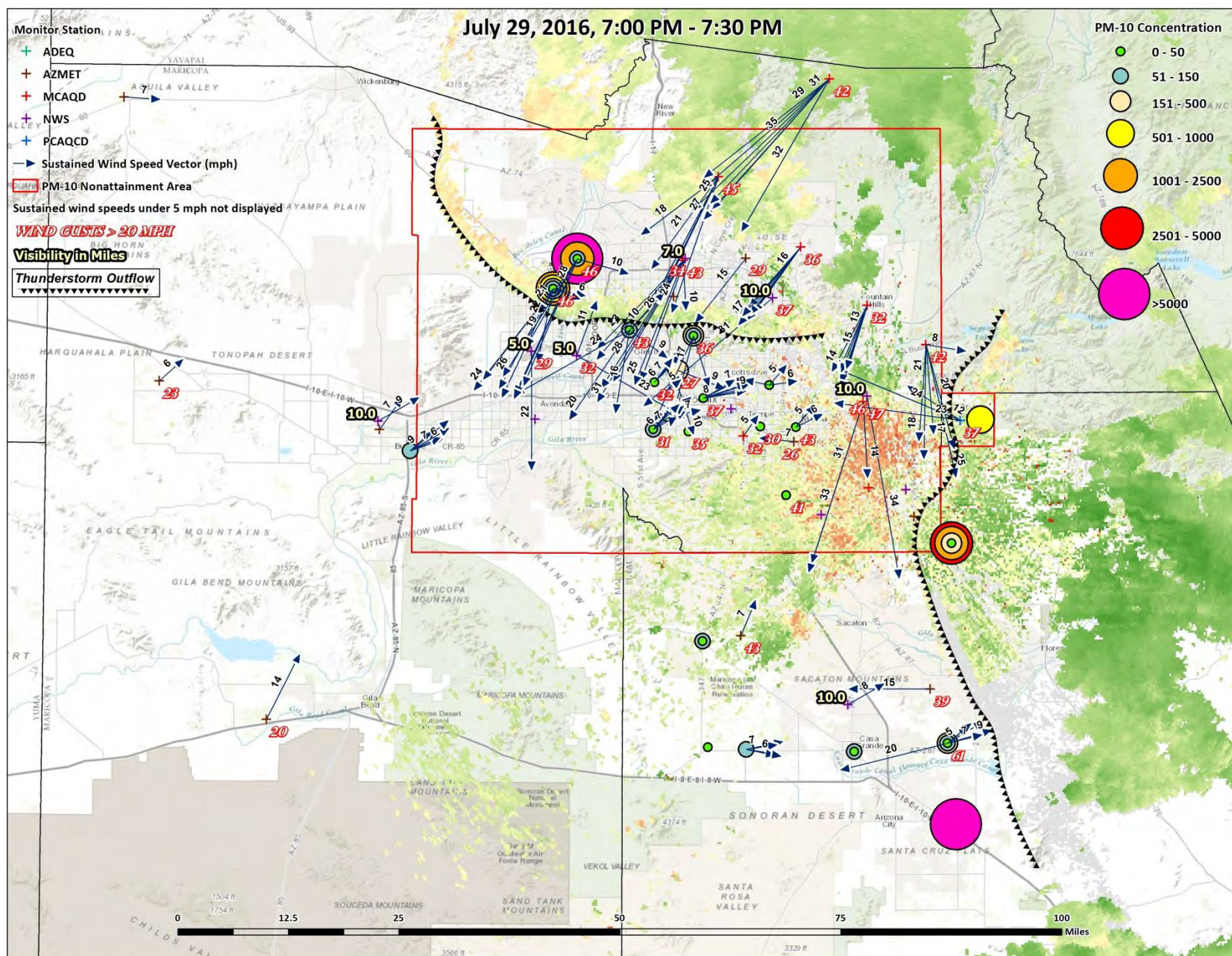


Figure 3-5. July 29, 2016, 7:00 PM – 7:30 PM.

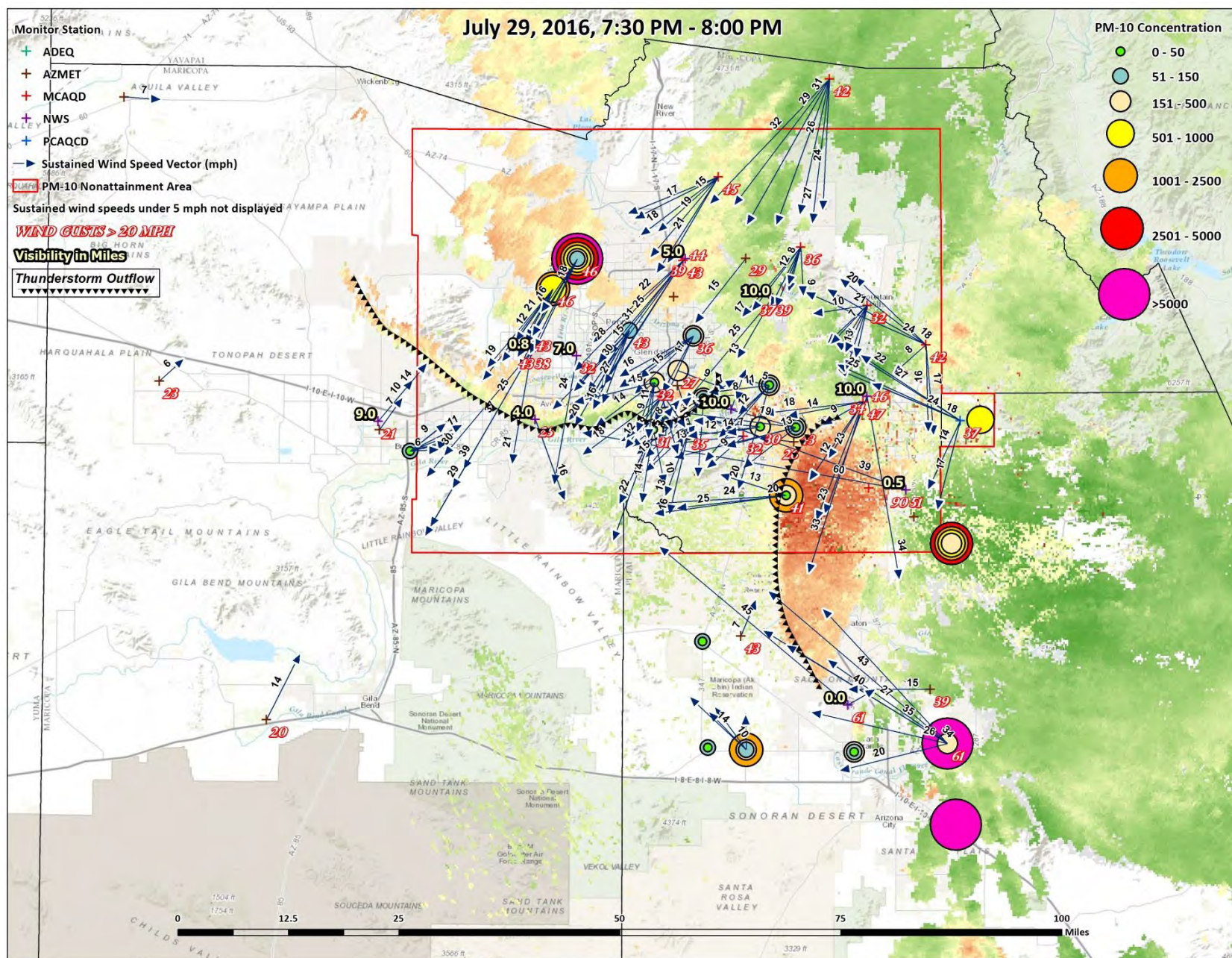


Figure 3-6. July 29, 2016, 7:30 PM – 8:00 PM.

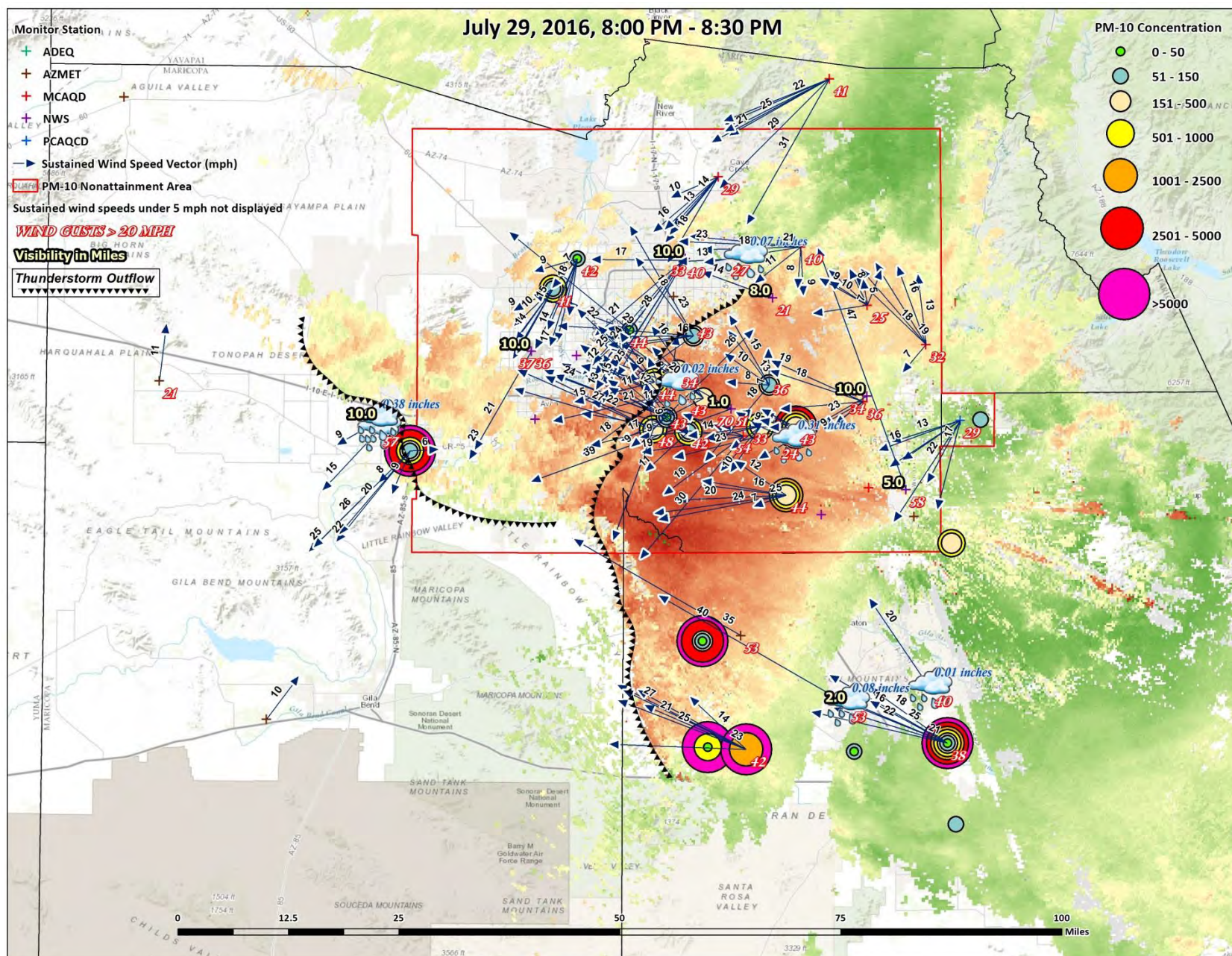


Figure 3-7. July 29, 2016, 8:00 PM – 8:30 PM.

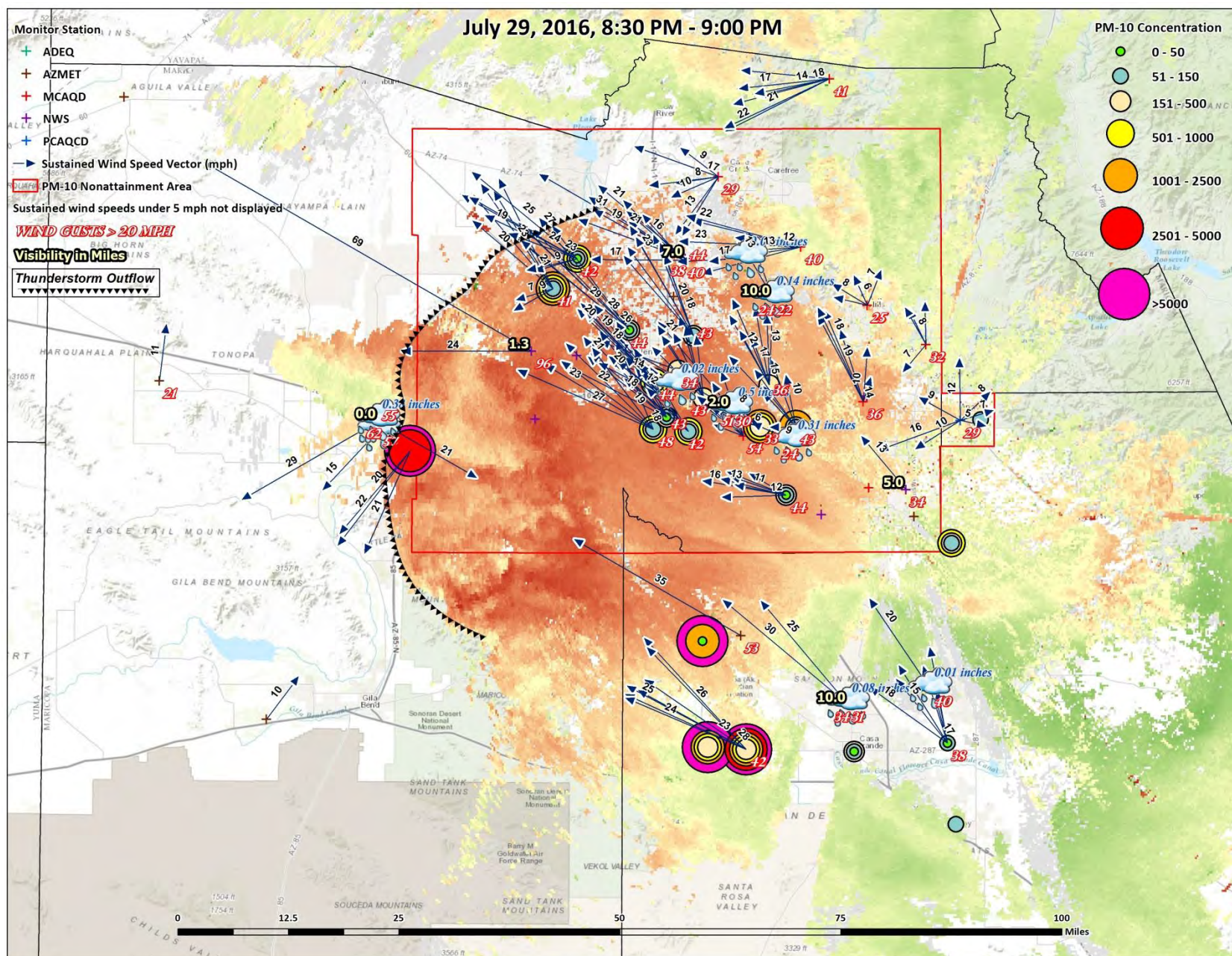


Figure 3-8. July 29, 2016, 8:30 PM – 9:00 PM.

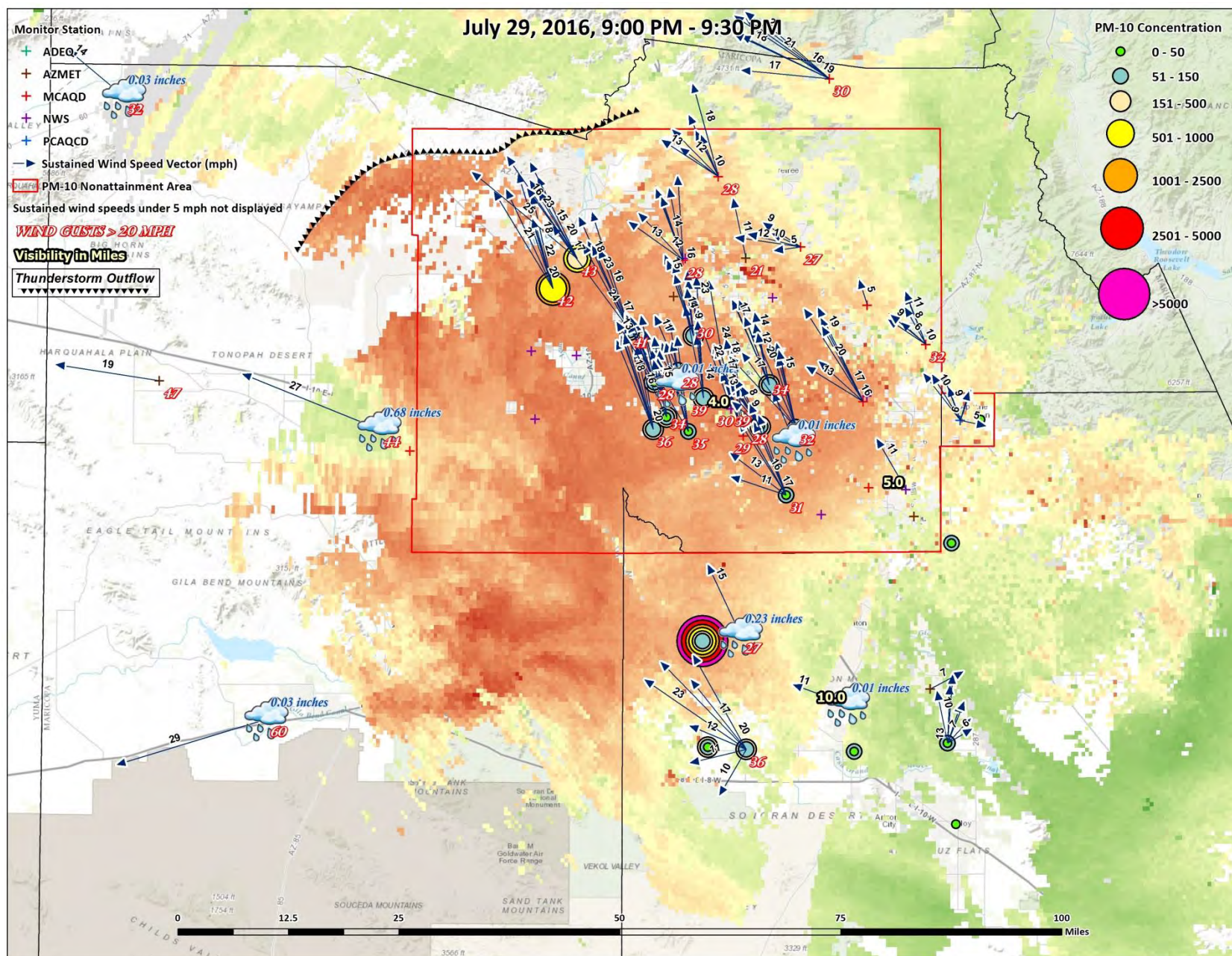


Figure 3-9. July 29, 2016, 9:00 PM – 9:30 PM.

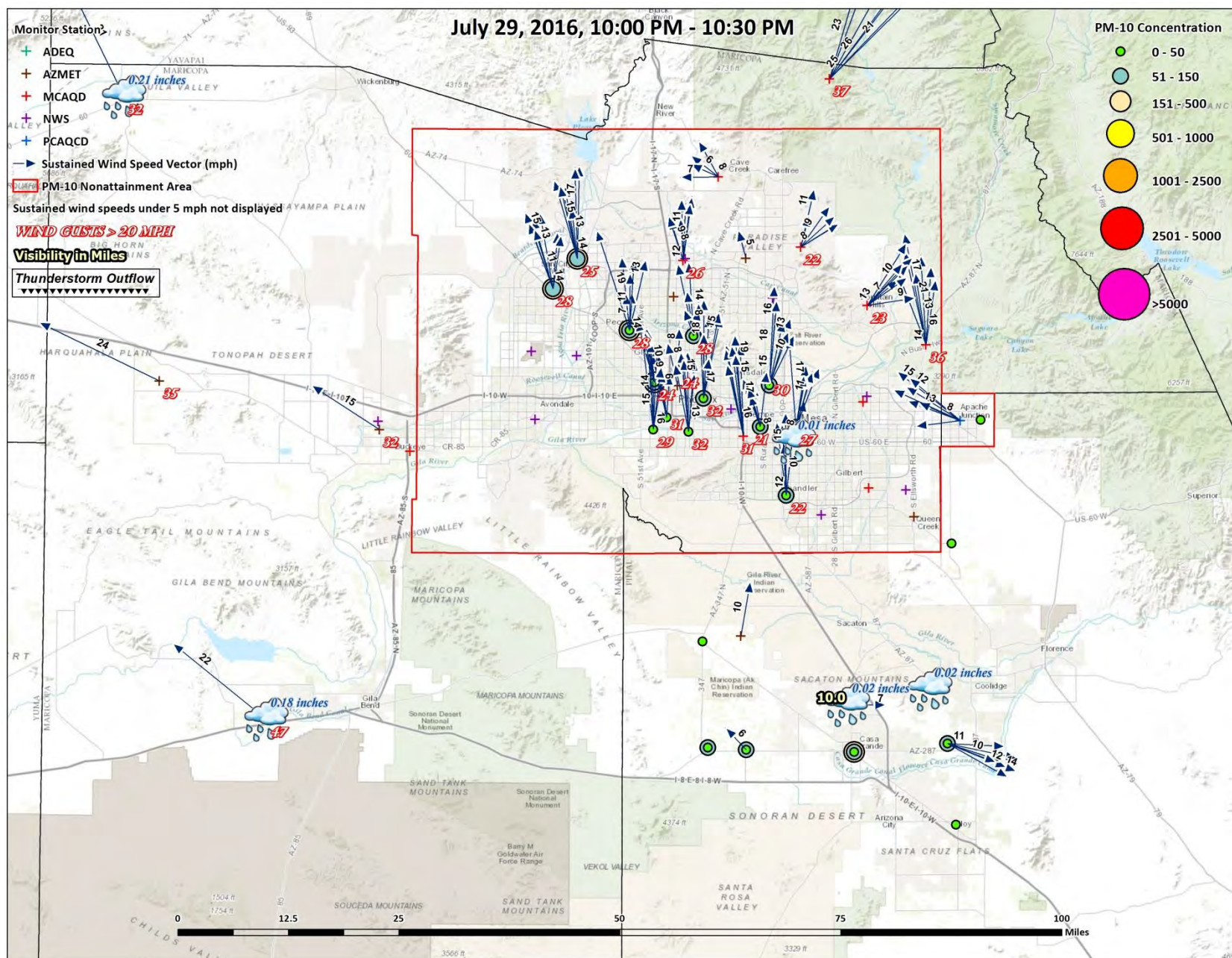


Figure 3-11. July 29, 2016, 10:00 PM – 10:30 PM.

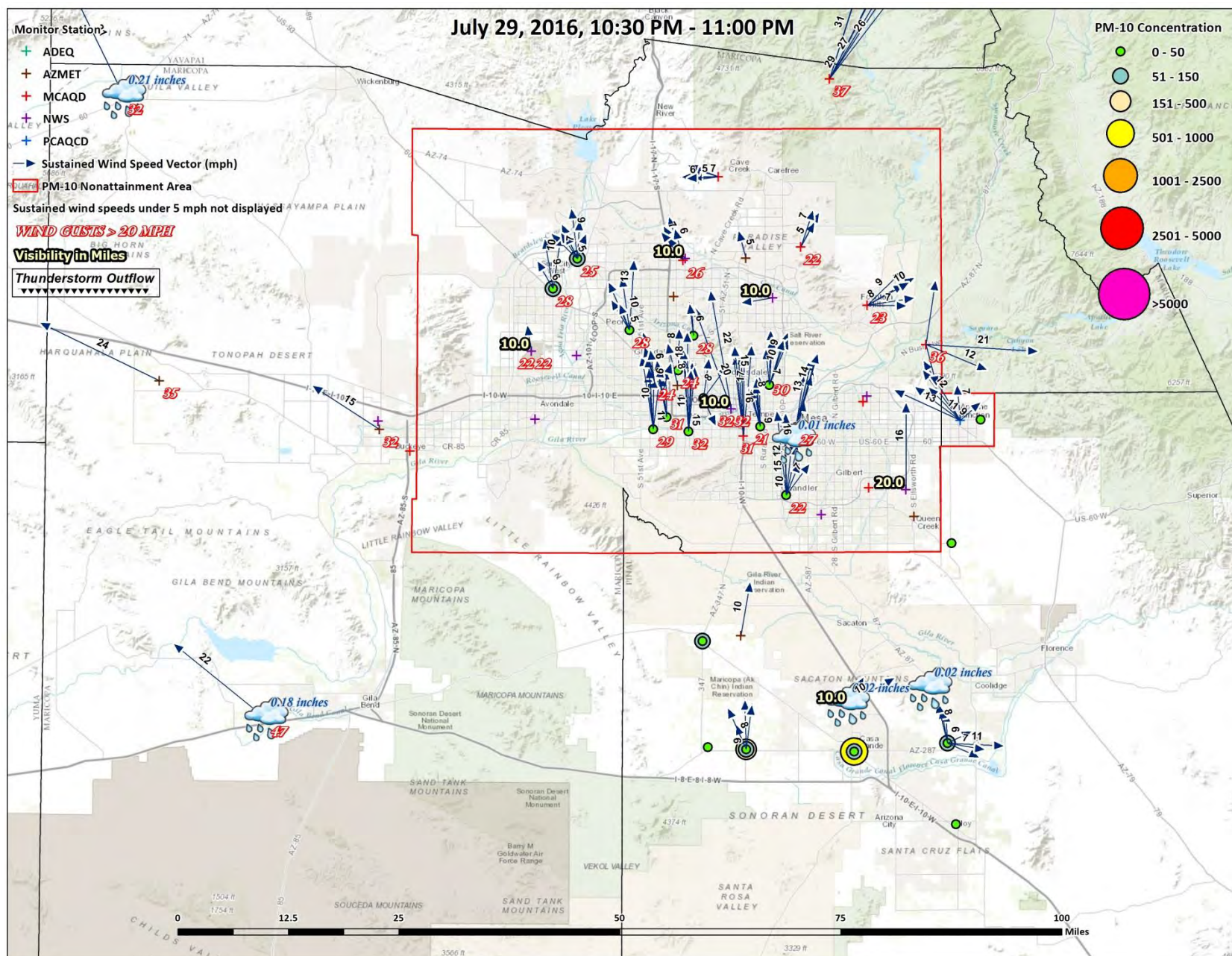
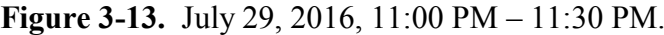


Figure 3-12. July 29, 2016, 10:30 PM – 11:00 PM.



Visibility Photos

ADEQ Visibility photos (White Tank Mountain) taken within the Maricopa County PM₁₀ nonattainment area show the degradation of visibility as windblown dust from the fast-moving outflow passes through the nonattainment area. These photos provide additional evidence of the clear causal relationship between transported windblown dust from the high wind dust event and the exceedance at the Zuni Hills monitor. Figure 3-15 displays visibility conditions on July 29, 2016 before (7:30 PM), during (7:45 PM) and immediately after arrival (8:00 PM) of the high wind dust event. The area of the visibility photo is south of the exceeding Zuni Hills monitor. As such, the timing of the photos is after the main outflow has passed over the Zuni Hills monitor and is approaching the southern Buckeye monitor.

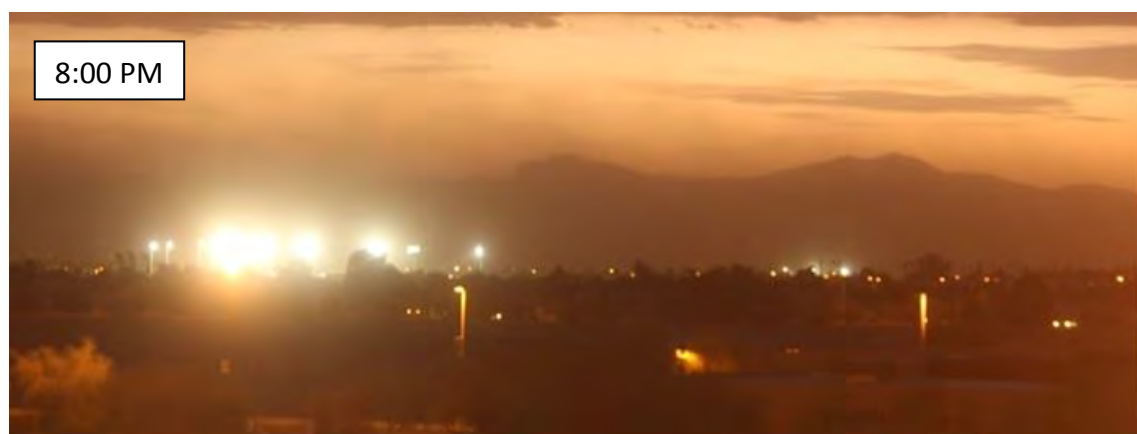
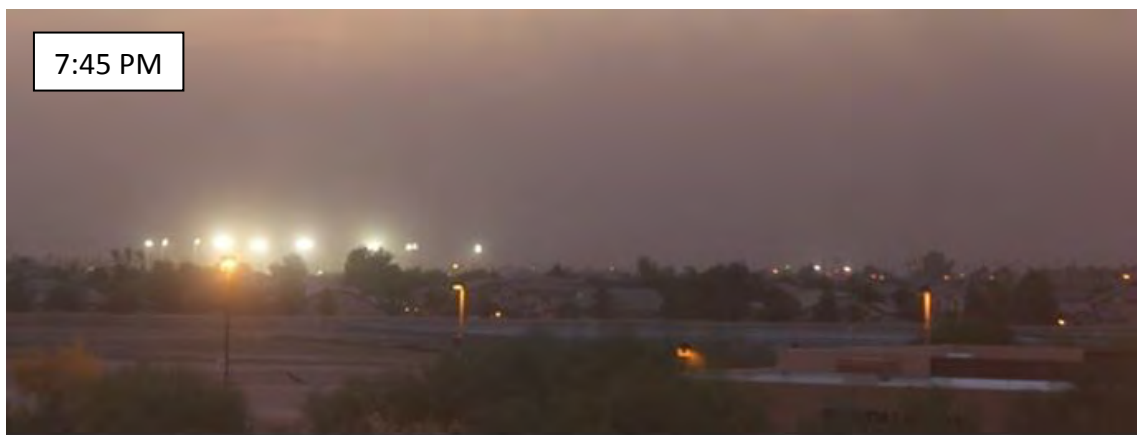
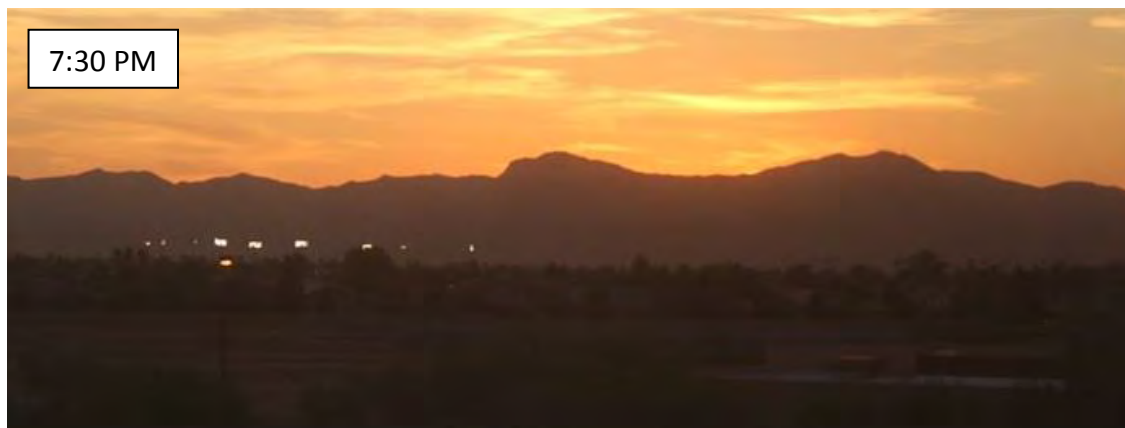


Figure 3-15. Visibility photos on July 29, 2016 at 7:30, 7:45 and 8:00 PM, respectively.

Conclusion

In summary, on July 29, 2016 an intense high wind dust event passed through the Maricopa County PM₁₀ nonattainment area which generated and transported windblown dust in the form of PM₁₀ resulting in elevated concentrations of PM₁₀ across the nonattainment area and an exceedance of the PM₁₀ standard at the Zuni Hills monitor. The monitored PM₁₀ concentrations on July 29, 2016 at the exceeding Zuni Hills monitor were compared to historical concentrations at the site in several analyses. The analyses confirm a clear causal relationship between the exceedance and the high wind dust event as compared to historical high wind dust event days and non-exceedance days.

In addition to the comparison to historical concentrations, figures displaying the chronological and spatial distribution of wind, visibility and PM₁₀ concentration data confirm that (1) sustained winds above 25 mph were high enough to entrain significant windblown dust from natural desert areas and disturbed, anthropogenic source areas subject to reasonable controls; (2) PM₁₀ concentrations peaked when winds speeds peaked; and (3) visibility conditions at nonattainment area monitors where the thunderstorm outflow generated windblown dust passed over or by were degraded as a result of the transported windblown dust from the high wind dust event. These analyses taken as a whole provide strong weight of evidence that the high wind dust event affected air quality in such a way that there exists a clear causal relationship between the high wind dust event on July 29, 2016 and the PM₁₀ exceedance at the Zuni Hills monitor on July 29, 2016, thus satisfying the clear causal relationship criterion.

IV. NATURAL EVENT AND NOT REASONABLY CONTROLLABLE OR PREVENTABLE CRITERIA

Natural Event

40 CFR Section 50.14(c)(3)(iv)(E) requires a demonstration that the exceptional event was either a human activity that is unlikely to recur at a particular location or was a natural event. The revised exceptional events rule defines a natural event at 40 CFR Section 50.1(k) as “an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. For purposes of the definition of a natural event, anthropogenic sources that are reasonably controlled shall be considered to not play a direct role in causing emissions.” Additionally, specific to high wind dust events, 40 CFR Section 50.14(b)(5)(ii) states that “[t]he Administrator will consider high wind dust events to be natural events in cases where windblown dust is entirely from natural undisturbed lands in the area or where all anthropogenic sources are reasonably controlled as determined in accordance with paragraph b(8) of this section.”

The clear causal relationship demonstration in the prior chapter found that high wind dust events can recur at the exceeding Zuni Hills monitor. Figure 3–1 indicates that 7 prior high wind dust events have occurred in the past five years at the monitor. The clear causal relationship demonstration also found that the PM₁₀ emissions which caused the exceedance at the Zuni Hills monitor were associated with windblown dust generated and transported by sustained wind speeds that exceeded the default high wind threshold of 25 mph established in 40 CFR Section 50.14(b)(5)(iii). EPA states in the preamble to the revised exceptional events rule that, “[f]or high wind dust events, if sustained wind speeds are above the high wind threshold and the anthropogenic emissions sources are reasonably controlled, it is more likely that human activity plays little or no direct role in causing emissions.” The following section of this chapter demonstrates that reasonable controls were in place on all windblown dust anthropogenic sources in the Maricopa County PM₁₀ nonattainment area during the high wind dust event. For these reasons, the high wind dust event on July 29, 2016, qualifies as a natural event.

Not Reasonably Controllable or Preventable

40 CFR Section 50.14(c)(3)(iv)(D) requires a demonstration that the exceptional event was both not reasonably controllable and not reasonably preventable. 40 CFR Section 50.14(b)(8) provides the demonstrations needed to establish that the exceptional event was not reasonably controllable or preventable for all exceptional events. Additionally, specific requirements regarding the not reasonably controllable or preventable criterion related to high wind dust events are provided in 40 CFR Section 50.14(b)(5).

40 CFR Sections 50.14(b)(8)(i) through (iii) states that “[t]he not reasonably controllable or preventable criterion has two prongs that the State must demonstrate: prevention and control. (ii) The Administrator shall determine an event is not reasonably preventable if the State shows that reasonable measures to prevent the event were applied at the time of the event. (iii) The Administrator shall determine that an event is not reasonably controllable if the State shows that reasonable measures to control the impact of the event on air quality were applied at the time of the event.”

Regarding whether the event was not reasonably preventable, the revised exceptional events rule has specific regulations for high wind dust events that exempt a State from needing to provide a case-specific

justification that the event was not reasonably preventable (40 CFR Section 50.14(b)(5)(iv)). In keeping with the specific high wind dust event regulation, and because the high winds that entrain the windblown dust are by nature unpreventable, a case-specific justification that the high wind dust event on July 29, 2016 was not preventable is not needed or presented in this documentation.

Regarding whether the event was not reasonably controllable, 40 CFR Section 50.14(b)(8)(iv) states that EPA “shall assess the reasonableness of available controls for anthropogenic sources based on information available as of the date of the event”. Additionally, 40 CFR Section 50.14(b)(8)(v) provides deference to controls in a state implementation plan that have been approved by EPA within five years of the event date, “the Administrator shall consider enforceable control measures implemented in accordance with a state implementation plan...approved by the EPA within 5 years of the date of the event, that address the event-related pollutant and all sources necessary to fulfill the requirements of the Clean Air Act for the state implementation plan...to be reasonable controls with respect to all anthropogenic sources that have or may have contributed to the monitored exceedance or violation.”

The *MAG 2012 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area* contains a wide variety of control measures and projects that have been implemented to reduce and control PM₁₀ emissions, including PM₁₀ emissions generated under high wind conditions, which were in place and implemented at the time of the event. Requirements to reduce and control PM₁₀ emissions in the plan apply to a broad range of sources including: unpaved roads and shoulders, leaf blowers, unpaved parking lots, vacant lots, sweeping streets with certified sweepers, off-road vehicle use, open and recreational burning, residential wood burning, covered vehicle loads, dust generating operations, nonmetallic mineral processing, and other unpermitted sources. EPA published final approval of the MAG 2012 Five Percent Plan on June 10, 2014 (79 FR 33107).

On September 12, 2016 the U.S. Court of Appeals for the Ninth Circuit issued an opinion in the lawsuit filed by the Arizona Center for Law in the Public Interest (*Bahr v. U.S. EPA*) to challenge the Environmental Protection Agency approval of the MAG 2012 Five Percent Plan. The Court upheld EPA’s determination that the control measures in the plan did not need to be updated and also upheld EPA’s exclusion of PM₁₀ exceedances in 2011 and 2012 as exceptional events caused by high wind dust events. The Court remanded the contingency measures in the plan to EPA for further consideration. Because EPA has approved the MAG 2012 Five Percent Plan within five years of the high wind dust event, and the approved plan addresses the event-related pollutant and all sources necessary to fulfill the requirements of the Clean Air Act, and because the State is not currently under obligation to revise the state implementation plan, the controls in the MAG 2012 Five Percent Plan are considered reasonable controls with respect to all anthropogenic sources that have or may have contributed to the monitored exceedance.

Specific to high wind dust events, 40 CFR Section 50.14(b)(5)(v) states that “[w]ith respect to the not reasonably controllable criterion of paragraph (c)(3)(iv)(D) of this section, dust controls on an anthropogenic source shall be considered reasonable in any case in which the controls render the anthropogenic source as resistant to high winds as natural undisturbed lands in the area affected by the high wind dust event. The Administrator may determine lesser controls reasonable on a case-by-case basis.”

When evaluating this regulation, EPA considers whether wind speeds were above the high wind threshold (25 mph default) during the event as an important indicator for whether or not the implemented controls were reasonable. In the preamble to the revised exceptional events rule, EPA states that, “[t]he EPA will continue to consider an area’s high wind threshold when reviewing demonstrations for events in a nonattainment or maintenance area where the EPA has approved a SIP, TIP or FIP within 5 years of the date of the event. For a demonstration in such a case, the not reasonably controllable criterion hinges only

on implementation of the control measures in the SIP, TIP or FIP, not on the content of those measures. For events with sustained wind speeds above the high wind threshold that occur simultaneously with high monitored PM concentrations, it is very plausible that SIP, TIP, or FIP controls were being implemented and the high PM concentrations resulted from emissions generated by sources in the area despite implementation of those controls...Therefore, the comparison of sustained wind speeds during an event to the high wind threshold will help the EPA Regional offices determine what evidence must be included in a demonstration. Specifically, it will inform the evidence required for the not reasonably controllable or preventable criteria, the possibility of noncompliance, or emissions from non-event sources.”

The clear causal relationship demonstration in Chapter III of this documentation clearly establishes that high PM₁₀ concentrations at the exceeding monitor and throughout the nonattainment area occurred when sustained wind speeds were over the high wind threshold of 25 mph. This provides evidence that (1) the controls in place within the Maricopa County PM₁₀ nonattainment area and at the exceeding monitor during the high wind dust event on July 29, 2016 meet the requirements of 40 CFR Section 50.14(b)(5)(v) by rendering anthropogenic sources as resistant to high winds as natural undisturbed lands, and that (2) source noncompliance is less likely given the severity of the wind speeds.

Lastly, 40 CFR Section 50.14(b)(8)(viii) requires that the State must include the following components in a demonstration that addresses the not reasonably controllable or preventable criterion for prescribed fire events and certain high wind dust events: “(A) Identification of the natural and anthropogenic sources of emissions causing and contributing to the monitored exceedance or violation, including the contribution from local sources. (B) Identification of the relevant state implementation plan, tribal implementation plan, or federal implementation plan or other enforceable control measures in place for sources identified in paragraph...(A) of this section and the implementation status of these controls. (C) Evidence of effective implementation and enforcement of the measures identified in paragraph...(B) of this section.” The following sections satisfy the requirements of 40 CFR Section 50.14(b)(8)(viii).

Identification of Natural and Anthropogenic Sources of Emissions

As discussed in the narrative conceptual model and the clear causal relationship demonstration, due to the high intensity of the high wind event, the sources of the windblown dust during the event on July 29, 2016 are the natural desert areas of Maricopa County (first main outflow event) and Pinal County (second main outflow event). If any anthropogenic source contributed to the event, any and all controls on those sources were uniformly overwhelmed by sustained winds in the 40 to 55 mph range, as reported by the NWS. Windblown dust was both transported to, and generated within, the Maricopa County PM₁₀ nonattainment area. Thunderstorm outflows originating in rural, northern Maricopa County and central Pinal County are the initial source areas of the windblown dust transported to the Maricopa County PM₁₀ nonattainment area.

The most likely natural sources given the prevailing wind patterns of the high wind event include the desert areas of northern Maricopa County and central Pinal County. The most likely anthropogenic sources to contribute to the exceedance at the Zuni Hills monitor include those sources located immediately upwind (northeast) of the monitor. The immediate area (within four miles) around the Zuni Hills monitor is suburban/semi-rural and includes scattered housing developments and open desert areas. Anthropogenic PM₁₀ emission sources in this area may likely include, but are not limited to, vacant lots, landscaping activities, and unpaved/paved road dust. Large tracks of undeveloped and developing desert lands immediately northeast of the Zuni Hills monitor exist that would be subject to the creation of windblown dust during a high wind event. Figure 4–1 displays a recent aerial photo (2015) of the area upwind (approximately five to six miles) of the Zuni Hills monitor.



Figure 4-1. Aerial photo of the immediate area upwind of the exceeding Zuni Hills monitor.

Identification of Relevant Control Measures

As discussed above, the *MAG 2012 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area* is the latest state implementation plan approved by EPA. This plan contains a wide variety of control measures and projects that have been, and are being, implemented to reduce and control PM₁₀ emissions, including PM₁₀ emissions generated under high wind conditions, which were in place and implemented at the time of the event. Requirements to reduce and control PM₁₀ emissions in the plan apply to a broad range of sources including: unpaved roads and shoulders, leaf blowers, unpaved parking lots, vacant lots, sweeping streets with certified sweepers, off-road vehicle use, open and recreational burning, residential wood burning, covered vehicle loads, dust generating operations, nonmetallic mineral processing, and other unpermitted sources. Table 4–1 lists the control measures included in the MAG 2012 Five Percent Plan.

Table 4-1. Control Measures included in the MAG 2012 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area.

Arizona Revised Statutes (A.R.S.)	Description
A.R.S. § 9-500.04. Only A.3., A.5., A.6., A.7., A.8., A.9. and H.	Air quality control; definitions [city and town requirements in Area A regarding targeting unpaved roads and shoulders; leaf blower restrictions; restrictions related to parking, maneuvering, ingress and egress areas and vacant lots; requirement for certified street sweepers]
A.R.S. § 9-500.27.	Off-road vehicle ordinance; applicability; violation; classification
A.R.S. § 11-871. Only A., B. and D.4.	Emissions control; no burn; exemptions; penalty [no burn restriction for any HPA day, increased civil penalty]
A.R.S. § 11-877.	Air quality control measures [county leaf blower restrictions]
A.R.S. § 28-1098. Only A. and C.1.	Vehicle loads; restrictions; civil penalties [for safety or air pollution prevention purpose]
A.R.S. § 49-424. Only 11.	Duties of department [develop and disseminate air quality dust forecasts for the Maricopa County PM-10 nonattainment area]
A.R.S. § 49-457.01.	Leaf blower use restrictions and training; leaf blower equipment sellers; informational material; outreach; applicability
A.R.S. § 49-457.03.	Off-road vehicles; pollution advisory days; applicability; penalties
A.R.S. § 49-457.04.	Off-highway vehicle and all-terrain vehicle dealers; informational material; outreach; applicability
A.R.S. § 49-457.05. Only A., B., C., D. and I.	Dust action general permit; best management practices; applicability; definitions
A.R.S. § 49-474.01. Only A.4., A.5., A.6., A.7., A.8., A.11., B. and H.	Additional board duties in vehicle emissions control areas; definitions [county requirements for stabilization of targeted unpaved roads, alleys and shoulders; restrictions related to parking, maneuvering, ingress and egress areas and vacant lots; requirement for certified street sweepers]
A.R.S. § 49-474.05.	Dust control; training; site coordinators
A.R.S. § 49-474.06.	Dust control; subcontractor registration; fee
A.R.S. § 49-501. Only A.2., B.1., C., F. and G.	Unlawful open burning; exceptions; civil penalty; definitions [ban on outdoor fires from May 1 to September 30; deletion of recreational purpose exemption; no burn day restrictions; penalty provision]
A.R.S. § 49-541. Only 1.	Definitions [Area A]
Maricopa County Air Quality Department Rules	Description
310	Fugitive Dust from Dust-Generating Operations Adopted 1/27/10 and submitted to EPA 4/12/10 [Notice of Final Rulemaking 75 FR 78167; 12/15/10]
310.01	Fugitive Dust From Non-Traditional Sources of Fugitive Dust Adopted 1/27/10 and submitted to EPA 4/12/10 [Notice of Final Rulemaking 75 FR 78167; 12/15/10]
314	Open Outdoor Fires and Indoor Fireplaces at Commercial and Institutional Establishments Adopted 3/12/08 and submitted to EPA 7/10/08 [Notice of Final Rulemaking 74 FR 57612; 11/9/09]

Table 4–1 (Continued)

Maricopa County Air Quality Department Rules	Description
316	Nonmetallic Mineral Processing Adopted 3/12/08 and submitted to EPA 7/10/08 [Notice of Final Rulemaking 74 FR 58553; 11/13/09]
Appendix C	Fugitive Dust Test Methods Adopted 3/26/08 and submitted to EPA 7/10/08 [Notice of Final Rulemaking 75 FR 78167; 12/15/10]
Maricopa County Ordinance	Description
P-26	Residential Woodburning Restriction Adopted 3/26/08 and submitted to EPA 7/10/08; [Notice of Final Rulemaking 74 FR 57612; 11/9/09]
Appendices to the Plan	Description
Appendix C, Exhibit 1	Arizona Revised Statutes Listed in Table 4-1
Appendix C, Exhibit 2	Maricopa County Resolution to Evaluate Measures in the MAG 2012 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area
Appendix C, Exhibit 3	Arizona Department of Environmental Quality Dust Action General Permit
Appendix C, Exhibit 4	Arizona Department of Environmental Quality Commitment to Revise the MAG 2012 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area if Necessary for the Emerging and Voluntary Measure

In addition to the statutes, rules and regulations listed in Table 4–1, other PM₁₀ reducing control measures (e.g., paving of unpaved roads, Agricultural Best Management Practices Program, Pinal County Fugitive Dust rules, etc.) have been committed to, and implemented by, local jurisdictions throughout the Maricopa County PM₁₀ nonattainment area, and incorporated into the Arizona SIP through prior PM₁₀ plans, such as the *Revised MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area*, and in separate EPA actions.

Implementation and Enforcement of Control Measures

The Maricopa County Air Quality Department (MCAQD) is prepared to proactively respond to high wind events and protect human health and well-being. MCAQD’s approach consists of two primary components: routine proactive inspections, as well as surveillance inspections, conducted both during and after significant events. MCAQD routinely inspects dust control-permitted sites and increases the frequency of inspections for permits covering areas of ten acres or more. Non-metallic surface mining sources under Rule 316 are also regularly inspected multiple times every year. Maricopa County also responds to the majority of air quality complaints within 24 hours.

Maricopa County monitors the five-day Maricopa County Dust Control Forecast issued by ADEQ to identify the potential for elevated PM₁₀ pollution levels due to high winds or stagnant conditions. When a High Pollution Advisory (HPA) is issued for Maricopa County, MCAQD conducts additional increased

surveillance before, during, and after the forecast event(s). MCAQD also conducts event surveillance and post-event activities after an exceptional event that had not been forecast (i.e., those instances in which an HPA had not been issued).

The Maricopa County Dust Control Forecast issued on July 28, 2016, indicated a Moderate risk for unhealthy PM₁₀ levels, due to possible gusty winds associated with thunderstorm outflows. Actual wind speeds were very intense on July 29, 2016 (sustained winds of 40 to 55 mph), leading to the exceedance at the Zuni Hills monitor.

Pre-event surveillance consists of surveying high-risk areas for any dust-generating activities, educating sources of the impending HPA event, and issuing violations for failure to comply with local, state, or federal regulations. During the event, MCAQD inspectors survey high-risk areas to confirm that control measures are in place, document any violations, and contact other regulatory agencies if necessary. Post-event activities include continued surveys of high-risk areas, re-inspecting sources within two business days of receiving a violation, and an internal MCAQD debriefing of event activities.

Currently, a total of 15 MCAQD air monitoring sites are equipped to allow the automatic reporting of monitored readings at 5-minute intervals. The real-time data reporting system includes a mechanism to alert MCAQD inspectors when PM₁₀ concentrations are elevated. The system allows MCAQD inspectors to review concentrations at the monitor and to consult the National Weather Service website to check for weather event activity. This capability allows the MCAQD responder to identify regional events and monitor specific issues. If necessary, the MCAQD responders can inform nearby stakeholders and local governments of the elevated PM₁₀ concentrations.

An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM₁₀ emissions. During the time period of July 26 to August 1, 2016, MCAQD inspectors conducted a total of 327 inspections of permitted facilities, of which 218 were at fugitive dust sources.

During this 7-day period, a total of 43 Notice of Violations were issued county-wide for PM₁₀- and non-PM₁₀-related violations. No violations were issued to fugitive dust sources within a 4-mile radius of the exceeding Zuni Hills site.

Also during this 7-day period, a total of 143 vacant lots were inspected, but only four 60-day letters were issued for non-compliant vacant lots and/or unpaved parking lots. These vacant lots were not located within 4-miles of the exceeding Zuni Hills site.

MCAQD was prepared for any complaints received due to the high wind event. During the 7-day period from July 26 through August 1, 2016, MCAQD received 32 complaints, of which 25 were windblown dust or PM₁₀ related. Two of these complaints, located for the same construction source, were located within 4 miles of the exceeding Zuni Hills monitor. These complaints consisted of:

- A construction site at Happy Valley Rd and Lake Pleasant Pkwy was creating dust. The complaint occurred on 7/26/16.
- A construction site (same construction project as previous complaint) at 93rd Ave and Happy Valley Rd was creating dust. The complaint occurred on 7/26/16.

Inspections were completed for each of these complaints and no issues or violations were noted. Both complaints were closed out. Additionally, during the period of July 26, 2016 through August 1, 2016, no

unusual agricultural activity in the upwind vicinity of the exceeding Zuni Hills monitor was noted by the Arizona Department of Environmental Quality.

Conclusion

In summary, the information presented in this chapter addresses whether the high wind dust event on July 29, 2016 was not reasonably preventable or controllable. EPA's approval of the *MAG 2012 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area* on June 10, 2014 allows the control measures in that plan to be established as reasonable controls. Sustained wind speeds were above the high wind threshold during the event, making it less likely that uncontrolled anthropogenic sources were the main source of the windblown dust emissions. The natural and anthropogenic sources of windblown dust during the event were identified, along with the enforceable control measures in place and implemented during the event. Extensive documentation of enforcement of the implemented control measures was provided by the Maricopa County Air Quality Department and the Arizona Department of Environmental Quality, revealing no evidence of unusual anthropogenic-based PM₁₀ emissions. For these reasons, the information presented in this chapter clearly demonstrates that the high wind dust event on July 29, 2016 was neither reasonably preventable nor controllable.

V. SUMMARY CONCLUSION

The documentation presented in the preceding chapters provides ample weight of evidence that the exceedance of the PM₁₀ standard on July 29, 2016 at the Zuni Hills monitor in the Maricopa County nonattainment area was caused by a high wind dust event, qualifying the exceedance for exclusion under the revised exceptional events rule. A bulleted summary of the demonstrations included in this documentation that meet the requirements of 40 CFR Sections 50.14(c)(3)(iv)(A) through (E) is provided below:

- The narrative conceptual model discussed the meteorological conditions (thunderstorm outflows) that led to the creation of the high wind dust event on July 29, 2016. The narrative highlighted that intense sustained winds of 40 to 55 mph and gusts up to 70 mph were sufficient to transport and generate windblown dust from natural sources and overwhelm reasonable controls on anthropogenic sources. The two main thunderstorm outflows which generated windblown dust originated in the desert areas of northern Maricopa County and central Pinal County. The windblown dust then transported into the Maricopa County PM₁₀ nonattainment area with the passing of the thunderstorm outflows. Tables and figures showing PM₁₀ concentrations during the event were included with the narrative, indicating the PM₁₀ concentrations on July 29, 2016 were elevated in conjunction with high winds and as compared to concentrations before and after the event.
- The monitored PM₁₀ concentration on July 29, 2016 at the exceeding Zuni Hills monitor was compared to historical concentrations at the site in several analyses. The analyses confirm a clear causal relationship between the exceedance and the high wind dust event as compared to historical high wind dust event days and non-exceedance days.

In addition to the comparison to historical concentrations, figures displaying the chronological and spatial distribution of wind, visibility and PM₁₀ concentration data confirm that (1) sustained winds above 25 mph were high enough to entrain significant windblown dust from natural desert areas and disturbed, anthropogenic source areas subject to reasonable controls; (2) PM₁₀ concentrations peaked when winds speeds peaked; and (3) visibility conditions at nonattainment area monitors where the thunderstorm outflow generated windblown dust passed over or by were degraded as a result of the transported windblown dust from the high wind dust event. These analyses taken as a whole provide strong weight of evidence that the high wind dust event affected air quality in such a way that there exists a clear causal relationship between the high wind dust event on July 29, 2016 and the PM₁₀ exceedance at the Zuni Hills monitor on July 29, 2016, thus satisfying the clear causal relationship criterion.

- The comparison to historical concentrations and the clear causal relationship demonstration found that high wind dust events can frequently recur at the exceeding Zuni Hills monitor and that the PM₁₀ emissions which caused the exceedance at the Zuni Hills monitor were associated with windblown dust generated and transported by sustained wind speeds that exceeded the default high wind threshold of 25 mph. EPA states that, “[f]or high wind dust events, if sustained wind speeds are above the high wind threshold and the anthropogenic emissions sources are reasonably controlled, it is more likely that human activity plays little or no direct role in causing emissions.” Since reasonable controls were in place on all significant anthropogenic sources of windblown dust in the Maricopa County PM₁₀ nonattainment area during the event and sustained winds were greater than 25 mph, the high wind dust event on July 29, 2016, qualifies as a natural event.

- EPA's approval of the *MAG 2012 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area* on June 10, 2014 allows the control measures in that plan to be established as reasonable controls. Intense sustained wind speeds were well above the high wind threshold during the event, making it unlikely that uncontrolled anthropogenic sources were the main source of the windblown dust emissions. The natural and anthropogenic sources of windblown dust during the event were identified, along with the enforceable control measures in place and implemented during the event. Extensive documentation of enforcement of the implemented control measures was provided by the Maricopa County Air Quality Department and the Arizona Department of Environmental Quality, revealing no evidence of unusual anthropogenic-based PM₁₀ emissions. For these reasons, the high wind dust event on July 29, 2016 was neither reasonably preventable nor controllable.


APPENDIX A

ADEQ FORECAST PRODUCTS



AIR QUALITY FORECAST ISSUED Thursday, July 28, 2016

This report is updated by 1:00 p.m. Sunday thru Friday and is valid for areas within and bordering Maricopa County in Arizona

FORECAST DATE NOTICES	YESTERDAY <u>Wed, 7/27/2016</u>	TODAY <u>Thu, 7/28/2016</u> Ozone High Pollution Advisory; Blowing Dust Possible 	TOMORROW <u>Fri, 7/29/2016</u> Blowing Dust Possible	EXTENDED <u>Sat, 7/30/2016</u> Blowing Dust Possible
AIR POLLUTANT	Highest AQI Reading/Site (*Preliminary data only*)			
O3	80 Apache Junction	105 Unhealthy for Sensitive Groups	84 Moderate	80 Moderate
CO	6 Diablo	6 Good	5 Good	5 Good
PM-10	62 Central Phoenix	52 Moderate	56 Moderate	56 Moderate
PM-2.5	38 Phoenix Supersite	25 Good	33 Good	33 Good

O3 = Ozone CO = Carbon Monoxide PM-10 = Particles 10 microns & smaller PM-2.5 = Particles smaller than 2.5 microns
 "High Pollution Advisory" (HPA) means that the highest concentration of OZONE, PM-10, or PM-2.5 may exceed the federal health standard.
 "Health Watch" (HW) means that the highest concentration of OZONE, PM-10 or PM-2.5 may approach the federal health standard.

Health Statements	
Thursday, 07/28/2016	Active children and adults and people with respiratory disease such as asthma should limit prolonged exertion outdoors.
Friday, 07/29/2016	Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.

If you haven't already, click [HERE](#) to start receiving your
Daily Air Quality Forecasts through GovDelivery.



Synopsis and Discussion

An Ozone High Pollution Advisory is valid for Thursday, July 28, 2016.

Note: During active monsoon periods, strong outflow winds from even distant thunderstorms can generate periods of dense blowing dust.

Ozone improved throughout the Valley yesterday as breezy, westerly winds dispersed it to the east. Even East Valley monitors saw better ozone levels, though ozone was still highest in the east. Somewhat lighter winds are expected today, which would enable ozone to increase. Ozone is expected to be highest in the east again. The High Pollution Advisory has not been extended into tomorrow (Friday) as the wind flow is forecast to support the movement of fresher air into the Valley and therefore, lower ozone levels. By Saturday, ozone is currently expected to improve even further with better winds.

Late last night, a storm outflow impacted the Valley from the southwest. Gusty winds and blowing dust were reported at Sky Harbor; several Phoenix PM-10 monitors ended the day in the Moderate AQI range. Looking ahead, storm outflows impacting the Valley will remain a possibility each afternoon/evening this week. Thus, there is a potential for Moderate PM-10 levels through at least Saturday.

Check back on Friday for a closer look at the weekend's weather and air quality. Until then, have a good day! –M.Graves

USEFUL LINKS	
INTERACTIVE MAPS	http://alert.fcd.maricopa.gov/alert/Google/v3/air.html http://www.airnow.gov/
WEB CAMERA IMAGES	http://www.phoenixvis.net/

POLLUTION MONITOR READINGS FOR Wednesday, July 27, 2016

O3 (OZONE)

SITE NAME	MAX 8-HR VALUE (PPB)	MAX AQI	AQI COLOR CODE
Alamo Lake	51	47	
Apache Junction	64	80	
Blue Point	63	77	
Buckeye	42	39	
Casa Grande	45	42	
Cave Creek	53	49	
Central Phoenix	53	49	
Dysart	43	40	
Falcon Field	63	77	
Fountain Hills	61	71	

Glendale	45	42	
Humboldt Mountain	54	50	
Phoenix Supersite	54	50	
Mesa	61	71	
North Phoenix	59	64	
Pinal Air Park	52	48	
Pinnacle Peak	60	67	
Queen Valley	64	80	
Rio Verde	49	45	
South Phoenix	50	46	
South Scottsdale	57	58	
Tempe	54	50	
Tonto Nat'l Mon.	60	67	
West Chandler	53	49	
West Phoenix	49	45	
Yuma	43	40	

CO (CARBON MONOXIDE)

SITE NAME	MAX 8-HR VALUE (PPM)	MAX AQI	AQI COLOR CODE
Central Phoenix	0.3	3	
Diablo	0.5	6	
Greenwood	0.4	5	
Phoenix Supersite	NOT AVBL	NOT AVBL	
West Phoenix	0.3	3	

PM-10 (PARTICLES)

SITE NAME	MAX 24-HR VALUE (µg/m3)	MAX AQI	AQI COLOR CODE
Buckeye	45.1	42	
Central Phoenix	78.8	62	
Combs School (Pinal County)	69.2	58	
Durango	37.5	34	
Dysart	39.1	36	
Glendale	25.3	23	
Greenwood	64.9	55	
Higley	NOT AVBL	NOT AVBL	
Maricopa (Pinal County)	83.7	65	
Phoenix Supersite	65.5	56	
Mesa	48.2	44	
North Phoenix	30.4	28	
South Phoenix	NOT AVBL	NOT AVBL	
South Scottsdale	62.1	54	
Tempe	26.4	24	
West Chandler	46.8	43	
West Forty Third	59.3	53	
West Phoenix	27.2	25	
Zuni Hills	35.1	32	

PM-2.5 (PARTICLES)

SITE NAME	MAX 24-HR VALUE (µg/m3)	MAX AQI	AQI COLOR CODE
Diablo	8.7	36	
Durango	6.6	28	
Glendale	5.7	24	
Phoenix Supersite	9.2	38	
Mesa	7.4	31	
North Phoenix	5.8	24	
South Phoenix	NOT AVBL	NOT AVBL	
Tempe	6.4	27	
West Phoenix	5.2	22	

DESCRIPTION OF LOCAL AIR POLLUTANTS IN DETAIL



O3 (OZONE):

Description –

This is a secondary pollutant that is formed by the reaction of other primary pollutants (precursors) such as VOCs (volatile organic compounds) and NO_x (Nitrogen Oxides) in the presence of sunlight.

Sources – VOCs are emitted from motor vehicles, chemical plants, refineries, factories, and other industrial sources. NO_x is emitted from motor vehicles, power plants, and other sources of combustion.

Potential health impacts – Exposure to ozone can make people more susceptible to respiratory infection, result in lung inflammation, and aggravate pre-existing respiratory diseases such as asthma. Other effects include decrease in lung function, chest pain, and cough.

Unit of measurement – Parts per billion (ppb).

Averaging interval – Highest eight-hour period within a 24-hour period (midnight to midnight)

Reduction tips – Curtail daytime driving, refuel cars and use gasoline-powered equipment as late in the day as possible.

CO (CARBON MONOXIDE):

Description – A colorless, odorless, poisonous gas formed when carbon in fuels is not burned completely.

Sources – In cities, as much as 95 percent of all CO emissions emanate from automobile exhaust. Other sources include industrial processes, non-transportation fuel combustion, and natural sources such as wildfires. Peak concentrations occur in colder winter months.

Potential health impacts – Reduces oxygen delivery to the body's organs and tissues. The health threat is most serious for those who suffer from cardiovascular disease.

Unit of measurement – Parts per million (ppm).

Averaging interval – Highest eight-hour period within a 24-hour period (midnight to midnight)

Reduction tips – Keep motor vehicle tuned properly and minimize nighttime driving.

PM-10 & PM-2.5 (PARTICLES):

Description – The term “particulate matter” (PM) includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. Particles less than 10 micrometers in diameter tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter are referred to as “fine” particles and are responsible for many visibility degradations such as the “Valley Brown Cloud” (see <http://www.phoenixvis.net/>). Particles with diameters between 2.5 and 10 micrometers are referred to as “coarse”.

Sources – Fine = All types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Coarse = crushing or grinding operations and dust from paved or unpaved roads.

Potential health impacts – PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis.

Units of measurement – Micrograms per cubic meter (µg/m³)

Averaging interval – 24 hours (midnight to midnight).

Reduction tips – Stabilize loose soils, slow down on dirt roads, carpool, and use public transit.

Updated 5/6/2016



AIR QUALITY FORECAST ISSUED Friday, July 29, 2016

This report is updated by 1:00 p.m. Sunday thru Friday and is valid for areas within and bordering Maricopa County in Arizona

FORECAST DATE NOTICES	YESTERDAY <u>Thu, 7/28/2016</u> Ozone Exceedance	TODAY <u>Fri, 7/29/2016</u> Blowing Dust Possible	TOMORROW <u>Sat, 7/30/2016</u> Blowing Dust Possible	EXTENDED <u>Sun, 7/31/2016</u> Blowing Dust Possible
AIR POLLUTANT	Highest AQI Reading/Site (*Preliminary data only*)			
O3	126 North Phoenix	84 Moderate	80 Moderate	80 Moderate
CO	6 Diablo	5 Good	5 Good	6 Good
PM-10	47 West 43rd	56 Moderate	56 Moderate	56 Moderate
PM-2.5	37 North Phoenix	33 Good	35 Good	35 Good

O3 = Ozone CO = Carbon Monoxide PM-10 = Particles 10 microns & smaller PM-2.5 = Particles smaller than 2.5 microns
 "High Pollution Advisory" (HPA) means that the highest concentration of OZONE, PM-10, or PM-2.5 may exceed the federal health standard.
 "Health Watch" (HW) means that the highest concentration of OZONE, PM-10 or PM-2.5 may approach the federal health standard.

Health Statements	
Friday, 07/29/2016	Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.
Saturday, 07/30/2016	Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.

If you haven't already, click [HERE](#) to start receiving your
Daily Air Quality Forecasts through GovDelivery.



Synopsis and Discussion

Note: During active monsoon periods, strong outflow winds from even distant thunderstorms can generate periods of dense blowing dust.

Ozone in the Valley this week has really depended upon the position of the high pressure that has wobbled over the Southwest over the past several days. Two days ago, ozone significantly improved across the Valley; yesterday, ozone was locked in over Phoenix and accumulated to some of the higher levels we've seen this summer. There is some disagreement between models on where the center of the high pressure will shift today, but winds are expected to be enough today to limit ozone. Already this morning, winds have been somewhat elevated. Moreover, through at least Sunday, winds are expected to continue helping limit ozone's potential.

As southern Arizona remains steeped in monsoonal moisture over the next several days, thunderstorms will be possible each afternoon/evening. In particular, models have been advertising this evening to be an active one for the Valley. If they are correct, then quite strong storm outflows are possible. Any rain following behind will help to put a stamp on blowing dust. PM-10 is forecast in the Moderate category through Sunday to account for the possibility of blowing dust each day.

Check back on Friday for a closer look at the weekend's weather and air quality. Until then, have a good day! –M.Graves

USEFUL LINKS	
INTERACTIVE MAPS	http://alert.fcd.maricopa.gov/alert/Google/v3/air.html http://www.airnow.gov/
WEB CAMERA IMAGES	http://www.phoenixvis.net/

POLLUTION MONITOR READINGS FOR Thursday, July 28, 2016

O3 (OZONE)

SITE NAME	MAX 8-HR VALUE (PPB)	MAX AQI	AQI COLOR CODE
Alamo Lake	52	48	
Apache Junction	68	93	
Blue Point	68	93	
Buckeye	54	50	
Casa Grande	56	54	
Cave Creek	59	64	
Central Phoenix	72	105	
Dysart	56	54	
Falcon Field	77	122	
Fountain Hills	66	87	

Glendale	54	50	
Humboldt Mountain	61	71	
Phoenix Supersite	76	119	
Mesa	74	112	
North Phoenix	78	126	
Pinal Air Park	63	77	
Pinnacle Peak	68	93	
Queen Valley	61	71	
Rio Verde	53	49	
South Phoenix	64	80	
South Scottsdale	75	115	
Tempe	66	87	
Tonto Nat'l Mon.	51	47	
West Chandler	65	84	
West Phoenix	70	100	
Yuma	40	37	

CO (CARBON MONOXIDE)

SITE NAME	MAX 8-HR VALUE (PPM)	MAX AQI	AQI COLOR CODE
Central Phoenix	0.4	5	
Diablo	0.5	6	
Greenwood	0.4	5	
Phoenix Supersite	NOT AVBL	NOT AVBL	
West Phoenix	0.4	5	

PM-10 (PARTICLES)

SITE NAME	MAX 24-HR VALUE (µg/m3)	MAX AQI	AQI COLOR CODE
Buckeye	36.6	33	
Central Phoenix	45.6	42	
Combs School (Pinal County)	32.1	30	
Durango	33.8	31	
Dysart	38.5	35	
Glendale	38.2	35	
Greenwood	45.7	42	
Higley	NOT AVBL	NOT AVBL	
Maricopa (Pinal County)	39.5	36	
Phoenix Supersite	35.5	32	
Mesa	20.7	19	
North Phoenix	44.6	41	
South Phoenix	16	15	
South Scottsdale	31.3	29	
Tempe	20.5	19	
West Chandler	27.2	25	
West Forty Third	51.9	47	
West Phoenix	34.6	31	
Zuni Hills	41.2	38	

PM-2.5 (PARTICLES)

SITE NAME	MAX 24-HR VALUE (µg/m3)	MAX AQI	AQI COLOR CODE
Diablo	7.7	32	
Durango	6.6	28	
Glendale	6.5	27	
Phoenix Supersite	7.2	30	
Mesa	6.2	26	
North Phoenix	8.9	37	
South Phoenix	2.9	12	
Tempe	5.3	22	
West Phoenix	6.3	26	

DESCRIPTION OF LOCAL AIR POLLUTANTS IN DETAIL



O3 (OZONE):

Description –

This is a secondary pollutant that is formed by the reaction of other primary pollutants (precursors) such as VOCs (volatile organic compounds) and NO_x (Nitrogen Oxides) in the presence of sunlight.

Sources – VOCs are emitted from motor vehicles, chemical plants, refineries, factories, and other industrial sources. NO_x is emitted from motor vehicles, power plants, and other sources of combustion.

Potential health impacts – Exposure to ozone can make people more susceptible to respiratory infection, result in lung inflammation, and aggravate pre-existing respiratory diseases such as asthma. Other effects include decrease in lung function, chest pain, and cough.

Unit of measurement – Parts per billion (ppb).

Averaging interval – Highest eight-hour period within a 24-hour period (midnight to midnight)

Reduction tips – Curtail daytime driving, refuel cars and use gasoline-powered equipment as late in the day as possible.

CO (CARBON MONOXIDE):

Description – A colorless, odorless, poisonous gas formed when carbon in fuels is not burned completely.

Sources – In cities, as much as 95 percent of all CO emissions emanate from automobile exhaust. Other sources include industrial processes, non-transportation fuel combustion, and natural sources such as wildfires. Peak concentrations occur in colder winter months.

Potential health impacts – Reduces oxygen delivery to the body's organs and tissues. The health threat is most serious for those who suffer from cardiovascular disease.

Unit of measurement – Parts per million (ppm).

Averaging interval – Highest eight-hour period within a 24-hour period (midnight to midnight)

Reduction tips – Keep motor vehicle tuned properly and minimize nighttime driving.

PM-10 & PM-2.5 (PARTICLES):

Description – The term “particulate matter” (PM) includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. Particles less than 10 micrometers in diameter tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter are referred to as “fine” particles and are responsible for many visibility degradations such as the “Valley Brown Cloud” (see <http://www.phoenixvis.net/>). Particles with diameters between 2.5 and 10 micrometers are referred to as “coarse”.

Sources – Fine = All types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Coarse = crushing or grinding operations and dust from paved or unpaved roads.

Potential health impacts – PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis.

Units of measurement – Micrograms per cubic meter (µg/m³)

Averaging interval – 24 hours (midnight to midnight).

Reduction tips – Stabilize loose soils, slow down on dirt roads, carpool, and use public transit.

Updated 5/6/2016



MARICOPA COUNTY DUST CONTROL FORECAST

ISSUED Thursday, July 28, 2016

Five-day weather outlook:

Note: During active monsoon periods, strong outflow winds from even distant thunderstorms can generate periods of dense blowing dust.

Thunderstorm activity is forecast to make its return to the Valley the next several days. Through the entire forecast period, thunderstorms are forecast to be in and around the area each afternoon/evening. We still need a good widespread soaking to limit the dust threat, unfortunately, rain coverage has still been too patchy. This means outflows still bring a serious dust concern when they blow over the dry desert regions. As a result, the Moderate dust risk will continue. Check back tomorrow for the latest update. Until then, enjoy your day! –R.Nicoll

R I S K F A C T O R S

	<u>WINDS</u>		<u>STAGNATION</u>		<u>DUST RISK LEVEL</u>
Day 1: Fri. 7/29/2016	Westerly winds around 10-15 mph in the afternoon, chances for afternoon gusty outflow winds.	+	Morning stagnation	=	MODERATE
Day 2: Sat. 7/30/2016	Westerly winds around 10-15 mph in the afternoon, chances for afternoon gusty outflow winds.	+	Morning stagnation	=	MODERATE
Day 3: Sun. 7/31/2016	Westerly winds around 10-15 mph in the afternoon, chances for afternoon gusty outflow winds.	+	Morning stagnation	=	MODERATE

EXTENDED OUTLOOK

Day 4: Mon. 8/1/2016	Westerly winds around 10-15 mph in the afternoon, chances for afternoon gusty outflow winds.	+	Morning stagnation	=	MODERATE
Day 5: Tue. 8/2/2016	Westerly winds around 10-15 mph in the afternoon, chances for afternoon gusty outflow winds.	+	Morning stagnation	=	MODERATE

The Maricopa County Dust Control Action Forecast is issued to assist in the planning of work activities to help reduce dust pollution. To review the complete air quality forecast for the Phoenix metropolitan area, as well as the health impacts for different air pollutants refer to ADEQ's Air Quality Forecast at <http://legacy.azdeq.gov/environ/air/ozone/ensemble.pdf>.

Updated 4/4/2016



MARICOPA COUNTY DUST CONTROL FORECAST

ISSUED Friday, July 29, 2016

Five-day weather outlook:

Note: During active monsoon periods, strong outflow winds from even distant thunderstorms can generate periods of dense blowing dust.

With an increase in moisture and instability, this active monsoon pattern is forecast to bring thunderstorms to the area the next several days. Strong outflow winds are expected this evening which could pick up some dust. However, the strongest outflows are forecast to come from thunderstorms northeast of Phoenix. This does somewhat limit the dust potential due to no dust source regions in that direction, but the threat exists nonetheless. Moving forward, active weather is forecast to persist through the forecast period. Thunderstorm outflows through the forecast period will continue to bring the threat of blowing dust. On a positive note, we do expect rain in and around the area the next few days. If we receive enough widespread rain over the dust source regions we may be able to lower the risk. However, in the meantime, we will be sticking with the Moderate risk. Check back on Sunday for the next update. Until then, have a great weekend! –R.Nicoll

R I S K F A C T O R S

	<u>WINDS</u>	<u>STAGNATION</u>	<u>DUST RISK LEVEL</u>
Day 1: Sat. 7/30/2016	Westerly winds around 10-15 mph in the afternoon, chances for afternoon gusty outflow winds.	+ Morning stagnation	= MODERATE
Day 2: Sun. 7/31/2016	Westerly winds around 10-15 mph in the afternoon, chances for afternoon gusty outflow winds.	+ No stagnation	= MODERATE
Day 3: Mon. 8/1/2016	Westerly winds around 10-15 mph in the afternoon, chances for afternoon gusty outflow winds.	+ Morning stagnation	= MODERATE

EXTENDED OUTLOOK

Day 4: Tue. 8/2/2016	Westerly winds around 10-15 mph in the afternoon, chances for afternoon gusty outflow winds.	+ Morning stagnation	= MODERATE
Day 5: Wed. 8/3/2016	Westerly winds around 10-15 mph in the afternoon, chances for afternoon gusty outflow winds.	+ Morning stagnation	= MODERATE

The Maricopa County Dust Control Action Forecast is issued to assist in the planning of work activities to help reduce dust pollution. To review the complete air quality forecast for the Phoenix metropolitan area, as well as the health impacts for different air pollutants refer to ADEQ's Air Quality Forecast at <http://legacy.azdeq.gov/environ/air/ozzone/ensemble.pdf>.

APPENDIX B

NWS METEOROLOGICAL OBSERVATIONS

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
BUCKEYE MUNICIPAL AIRPORT (00226)
BUCKEYE, AZ
(07/2016)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1021 ft. above sea level

Latitude: 33.417

Longitude: -112.683

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	0015	0	CLR	10.00		95	35.0	73	22.9	63	17.0	35	6	110		28.69			M	AA		29.77
29	0035	0	CLR	10.00		93	34.0	73	22.6	63	17.0	37	6	110		28.69			M	AA		29.77
29	0055	0	CLR	10.00		93	34.0	72	22.0	61	16.0	34	5	090		28.69			M	AA		29.77
29	0115	0	CLR	10.00		93	34.0	72	22.0	61	16.0	34	6	180		28.69			M	AA		29.77
29	0155	0	CLR	10.00		91	33.0	72	22.3	63	17.0	39	6	230		28.69			M	AA		29.77
29	0215	0	BKN120	10.00		93	34.0	72	22.0	61	16.0	34	7	220		28.69			M	AA		29.77
29	0235	0	OVC120	10.00		93	34.0	72	22.0	61	16.0	34	8	220		28.69			M	AA		29.77
29	0255	0	OVC120	10.00		90	32.0	73	22.5	64	18.0	42	5	210		28.69			M	AA		29.77
29	0315	0	OVC120	10.00		91	33.0	72	22.3	63	17.0	39	7	220		28.69			M	AA		29.77
29	0335	0	OVC120	10.00		91	33.0	71	21.7	61	16.0	37	7	240		28.70			M	AA		29.78
29	0355	0	OVC120	10.00		91	33.0	71	21.7	61	16.0	37	9	240		28.71			M	AA		29.79
29	0415	0	OVC120	10.00		91	33.0	71	21.7	61	16.0	37	13	240	18	28.71			M	AA		29.80
29	0435	0	OVC120	10.00		90	32.0	71	21.6	61	16.0	38	10	220		28.74			M	AA		29.82
29	0455	0	OVC120	10.00		90	32.0	71	21.6	61	16.0	38	7	260		28.74			M	AA		29.82
29	0515	0	OVC120	10.00		88	31.0	71	21.8	63	17.0	43	9	250		28.74			M	AA		29.82
29	0535	0	FEW070 SCT100 OVC120	10.00		88	31.0	71	21.8	63	17.0	43	8	270		28.75			M	AA		29.84
29	0555	0	BKN120	10.00		88	31.0	71	21.8	63	17.0	43	9	270		28.75			M	AA		29.84
29	0615	0	SCT120	9.00		86	30.0	71	21.8	64	18.0	48	11	250		28.75			M	AA		29.84
29	0635	0	SCT120	10.00		86	30.0	71	21.8	64	18.0	48	0	000		28.77			M	AA		29.86
29	0655	0	BKN120	10.00		88	31.0	72	22.2	64	18.0	45	8	240		28.77			M	AA		29.85
29	0715	0	SCT120	10.00		90	32.0	73	22.5	64	18.0	42	8	250		28.77			M	AA		29.86
29	0735	0	FEW120	10.00		90	32.0	73	22.5	64	18.0	42	14	230		28.77			M	AA		29.86
29	0755	0	CLR	10.00		91	33.0	73	22.6	64	18.0	41	11	240		28.78			M	AA		29.87
29	0815	0	CLR	10.00		91	33.0	73	22.6	64	18.0	41	8	240		28.79			M	AA		29.88
29	0835	0	CLR	10.00		93	34.0	73	22.9	64	18.0	38	8	230		28.78			M	AA		29.87
29	0855	0	CLR	10.00		93	34.0	73	22.9	64	18.0	38	8	230		28.78			M	AA		29.87
29	0915	0	CLR	10.00		93	34.0	73	22.6	63	17.0	37	9	220		28.78			M	AA		29.87
29	0935	0	CLR	10.00		95	35.0	73	22.9	63	17.0	35	7	230		28.77			M	AA		29.86
29	0955	0	CLR	10.00		95	35.0	73	22.9	63	17.0	35	7	240		28.77			M	AA		29.86
29	1015	0	CLR	10.00		99	37.0	74	23.5	63	17.0	31	8	260		28.77			M	AA		29.86
29	1035	0	CLR	10.00		99	37.0	74	23.5	63	17.0	31	6	240		28.77			M	AA		29.85
29	1055	0	CLR	10.00		100	38.0	74	23.1	61	16.0	28	8	280		28.77			M	AA		29.85
29	1115	0	CLR	10.00		100	38.0	74	23.1	61	16.0	28	10	250		28.75			M	AA		29.84
29	1135	0	CLR	10.00		100	38.0	73	22.6	59	15.0	26	10	250		28.75			M	AA		29.84
29	1155	0	CLR	10.00		102	39.0	73	22.9	59	15.0	24	6	280		28.74			M	AA		29.83
29	1215	0	CLR	10.00		102	39.0	73	22.9	59	15.0	24	10	240		28.74			M	AA		29.82
29	1235	0	CLR	10.00		102	39.0	73	22.9	59	15.0	24	6	240		28.73			M	AA		29.81
29	1255	0	CLR	10.00		106	41.0	73	22.9	57	14.0	20	9	280		28.71			M	AA		29.80
29	1315	0	CLR	10.00		106	41.0	73	22.9	57	14.0	20	10	300		28.71			M	AA		29.79
29	1335	0	CLR	10.00		108	42.0	73	22.7	55	13.0	17	0	000		28.70			M	AA		29.78
29	1355	0	M	10.00		106	41.0	72	22.4	55	13.0	19	5	240		28.68			M	AA		29.76
29	1415	0	M	10.00		108	42.0	73	22.7	55	13.0	17	13	220	16	28.67			M	AA		29.75
29	1435	0	M	10.00		109	43.0	73	22.9	55	13.0	17	9	260		28.66			M	AA		29.74
29	1455	0	M	10.00		109	43.0	73	22.9	55	13.0	17	10	240		28.64			M	AA		29.72
29	1515	0	M	10.00		109	43.0	73	22.6	54	12.0	16	13	270	18	28.63			M	AA		29.71
29	1535	0	CLR	10.00		111	44.0	73	22.9	54	12.0	15	13	280	17	28.62			M	AA		29.70
29	1555	0	CLR	10.00		111	44.0	73	22.5	52	11.0	14	10	260		28.60			M	AA		29.68
29	1615	0	CLR	10.00		111	44.0	73	22.9	54	12.0	15	13	230	20	28.59			M	AA		29.67
29	1635	0	CLR	10.00		111	44.0	73	22.9	54	12.0	15	7	320		28.59			M	AA		29.67
29	1655	0	CLR	10.00		111	44.0	73	22.5	52	11.0	14	13	310	16	28.58			M	AA		29.66
29	1715	0	CLR	10.00		111	44.0	73	22.9	54	12.0	15	9	230		28.58			M	AA		29.66
29	1735	0	CLR	10.00		111	44.0	73	22.9	54	12.0	15	6	270		28.57			M	AA		29.65
29	1755	0	CLR	10.00		111	44.0	74	23.1	55	13.0	16	7	250	18	28.57			M	AA		29.65
29	1815	0	CLR	10.00		111	44.0	73	22.9	54	12.0	15	8	260		28.56			M	AA		29.64
29	1835	0	CLR	10.00		109	43.0	71	21.8	50	10.0	14	10	250		28.57			M	AA		29.65
29	1855	0	CLR	10.00		109	43.0	71	21.4	48	9.0	13	11	270		28.58			M	AA		29.66
29	1915	0	CLR	10.00		109	43.0	71	21.8	50	10.0	14	9	240		28.60			M	AA		29.68
29	1935	0	CLR	9.00		104	40.0	74	23.1	59	15.0	23	10	220	17	28.61			M	AA		29.69
29	1955	0	FEW120	10.00		104	40.0	74	23.1	59	15.0	23	14	220	21	28.62			M	AA		29.70
29	2015	0	SCT120	10.00		104	40.0	75	23.7	61	16.0	24	9	060		28.65			M	AA	0.38	29.73
29	2035	0	BKN001 OVC100	0.50		95	35.0	71	21.8	59	15.0	30	29	060	55	28.67			M	AA	0.38	29.75
29	2055	0	M	0.00		77	25.0	74	23.0	72	22.0	85	21	300	62	28.82			M	AA	0.38	29.91s

Dynamically generated Thu Feb 23 12:02:35 EST 2017 via <http://www.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)
HOURLY OBSERVATIONS TABLE
CASA GRANDE MUNICIPAL ARPT (03914)
CASA GRANDE, AZ
(07/2016)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1462 ft. above sea level

Latitude: 32.95

Longitude: -111.766

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	0015	0	CLR	10.00		97	36.0	73	22.6	61	16.0	30	13	280		28.27		M	AA		29.81	
29	0035	0	CLR	10.00		97	36.0	73	22.6	61	16.0	30	13	280		28.27		M	AA		29.81	
29	0055	0	CLR	10.00		97	36.0	73	22.6	61	16.0	30	10	270		28.27		M	AA		29.81	
29	0115	0	CLR	10.00		95	35.0	72	22.3	61	16.0	32	9	270		28.25		M	AA		29.80	
29	0135	0	CLR	10.00		93	34.0	72	22.0	61	16.0	34	9	280		28.25		M	AA		29.80	
29	0155	0	CLR	10.00		93	34.0	72	22.0	61	16.0	34	9	260		28.27		M	AA		29.81	
29	0215	0	CLR	10.00		93	34.0	72	22.0	61	16.0	34	8	250		28.27		M	AA		29.81	
29	0235	0	CLR	10.00		90	32.0	72	22.1	63	17.0	41	5	240		28.27		M	AA		29.81	
29	0255	0	CLR	10.00		90	32.0	72	22.1	63	17.0	41	6	230		28.27		M	AA		29.82	
29	0315	0	CLR	10.00		90	32.0	72	22.4	64	18.0	42	10	210		28.28		M	AA		29.83	
29	0335	0	CLR	10.00		90	32.0	72	22.4	64	18.0	42	16	200		28.28		25	M		AA	29.83
29	0355	0	CLR	10.00		90	32.0	72	22.1	63	17.0	41	14	200		28.28		M	AA		29.83	
29	0415	0	CLR	10.00		90	32.0	72	22.1	63	17.0	41	10	200		28.28		M	AA		29.83	
29	0435	0	CLR	10.00		88	31.0	71	21.8	63	17.0	43	7	200		28.28		M	AA		29.83	
29	0455	0	CLR	10.00		88	31.0	71	21.8	63	17.0	43	9	190		28.29		M	AA		29.84	
29	0515	0	CLR	10.00		88	31.0	71	21.8	63	17.0	43	10	200		28.30		M	AA		29.85	
29	0535	0	CLR	10.00		88	31.0	71	21.8	63	17.0	43	8	190		28.31		M	AA		29.86	
29	0555	0	CLR	10.00		86	30.0	71	21.5	63	17.0	46	6	210		28.32		M	AA		29.87	
29	0615	0	CLR	10.00		86	30.0	71	21.5	63	17.0	46	6	200		28.33		M	AA		29.88	
29	0635	0	CLR	10.00		88	31.0	71	21.8	63	17.0	43	8	200		28.33		M	AA		29.88	
29	0655	0	CLR	10.00		88	31.0	72	22.1	64	18.0	45	8	200		28.33		M	AA		29.88	
29	0715	0	CLR	10.00		88	31.0	72	22.1	64	18.0	45	7	210		28.33		M	AA		29.88	
29	0735	0	CLR	10.00		90	32.0	72	22.4	64	18.0	42	9	190		28.34		M	AA		29.89	
29	0755	0	CLR	10.00		91	33.0	72	22.3	63	17.0	39	8	230		28.34		M	AA		29.89	
29	0815	0	CLR	10.00		93	34.0	72	22.0	61	16.0	34	6	230		28.35		M	AA		29.90	
29	0835	0	CLR	10.00		93	34.0	72	22.0	61	16.0	34	11	250		28.35		M	AA		29.90	
29	0855	0	CLR	10.00		95	35.0	72	22.3	61	16.0	32	10	240		28.35		M	AA		29.90	
29	0915	0	CLR	10.00		97	36.0	73	22.6	61	16.0	30	14	250		28.35		M	AA		29.90	
29	0935	0	CLR	10.00		97	36.0	73	22.6	61	16.0	30	11	250		28.34		M	AA		29.89	
29	0955	0	CLR	10.00		99	37.0	74	23.5	63	17.0	31	8	220		28.34		M	AA		29.89	
29	1015	0	CLR	10.00		99	37.0	74	23.5	63	17.0	31	13	240		28.33		16	M		AA	29.88
29	1035	0	CLR	10.00		99	37.0	74	23.5	63	17.0	31	9	190		28.33		M	AA		29.88	
29	1055	0	CLR	10.00		100	38.0	75	23.6	63	17.0	30	5	060		28.32		M	AA		29.87	
29	1115	0	CLR	10.00		102	39.0	74	23.3	61	16.0	26	8	020		28.32		M	AA		29.87	
29	1135	0	CLR	10.00		102	39.0	74	23.3	61	16.0	26	5	230		28.31		M	AA		29.86	
29	1155	0	CLR	10.00		102	39.0	74	23.3	61	16.0	26	6	120		28.31		M	AA		29.86	
29	1215	0	CLR	9.00		102	39.0	75	23.9	63	17.0	28	8	320		28.30		16	M		AA	29.85
29	1235	0	CLR	10.00		102	39.0	75	23.9	63	17.0	28	7	320		28.29		M	AA		29.84	
29	1255	0	CLR	10.00		104	40.0	76	24.1	63	17.0	26	6	320		28.28		M	AA		29.83	
29	1315	0	CLR	10.00		104	40.0	75	23.6	61	16.0	24	6	240		16		28.28	M		AA	29.83
29	1335	0	CLR	10.00		106	41.0	75	23.9	61	16.0	23	10	270		16		28.27	M		AA	29.82
29	1355	0	CLR	10.00		106	41.0	75	23.9	61	16.0	23	14	260		17		28.27	M		AA	29.81
29	1415	0	CLR	10.00		106	41.0	75	23.9	61	16.0	23	0	000				28.25	M		AA	29.79
29	1435	0	CLR	10.00		108	42.0	76	24.1	61	16.0	22	9	250		18		28.24	M		AA	29.78
29	1455	0	CLR	10.00		108	42.0	76	24.1	61	16.0	22	9	280				28.23	M		AA	29.77
29	1515	0	CLR	10.00		108	42.0	75	23.6	59	15.0	20	9	300		16		28.22	M		AA	29.76
29	1535	0	CLR	10.00		108	42.0	75	23.6	59	15.0	20	10	280		18		28.20	M		AA	29.74
29	1555	0	CLR	10.00		108	42.0	75	23.6	59	15.0	20	15	260		18		28.19	M		AA	29.73
29	1615	0	CLR	10.00		109	43.0	75	23.7	59	15.0	20	11	280		18		28.19	M		AA	29.73
29	1635	0	CLR	10.00		108	42.0	75	23.6	59	15.0	20	9	290		18		28.18	M		AA	29.72
29	1655	0	CLR	10.00	109	43.0	75	23.7	59	15.0	20	16	270	22	28.17	M	AA	29.71				
29	1715	0	CLR	10.00	108	42.0	75	23.6	59	15.0	20	14	260	20	28.17	M	AA	29.71				
29	1735	0	CLR	10.00	109	43.0	74	23.3	57	14.0	18	14	250	20	28.17	M	AA	29.71				
29	1755	0	CLR	10.00	108	42.0	74	23.1	57	14.0	19	15	270		28.17	M	AA	29.71				
29	1815	0	CLR	10.00	108	42.0	74	23.1	57	14.0	19	13	270		28.17	M	AA	29.71				
29	1835	0	CLR	10.00	108	42.0	74	23.1	57	14.0	19	14	250		28.18	M	AA	29.72				
29	1855	0	CLR	10.00	106	41.0	74	23.3	59	15.0	21	11	230		28.21	M	AA	29.75				
29	1915	0	CLR	10.00	106	41.0	74	23.3	59	15.0	21	8	240		28.23	M	AA	29.77				
29	1935	0	CLR	10.00	106	41.0	74	23.3	59	15.0	21	6	240		28.24	M	AA	29.78				
29	1955	0	OVC001	0.00	VCTS	97	36.0	71	21.5	57	14.0	26	45s	130	61	28.30	M	AA		29.85		
29	2015	0	BKN001 BKN008 OVC012	2.00	TS	75	24.0s	70	21.3	68	20.0	79	40	120	53	28.37	M	AA		0.08	29.92	
29	2035	0	FEW009 FEW017 SCT110	10.00	TS	75	24.0s	72	22.0	70	21.0	85	30	130	34	28.38	M	AA		0.08	29.93	
29	2055	0	BKN110	10.00	VCTS	77	25.0	71	21.6	68	20.0	74	25	140	31	28.37	M	AA		0.08	29.92	
29	2115	0	FEW031 SCT050 OVC110	10.00	VCTS	79	26.0s	72	22.0	68	20.0	69	11	110		28.42	M	AA		0.01	29.97	
29	2135	0	FEW031 SCT050 BKN070	10.00	VCTS	79	26.0s	70	21.3	66	19.0	65	8	360		28.44	M	AA		0.01	29.99	
29	2155	0	BKN070 OVC090	10.00		79	26.0	73	22.7	70	21.0	74	7	320		28.46	M	AA		0.01	30.01s	
29	2215	0	BKN070 OVC090	10.00		79	26.0s	73	22.7	70	21.0	74	7	270		28.44	M	AA		0.02	29.99	
29	2235	0	FEW050 SCT070 BKN085	10.00		79	26.0s	73	22.7	70	21.0	74	6	210		28.44	M	AA		0.02	29.99	
29	2255	0	SCT050 BKN070 OVC085	10.00		79	26.0	72	22.0	68	20.0	69	10	240		28.40	M	AA		0.02	29.95	
29																						

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
CHANDLER MUNICIPAL AIRPORT (53128)
CHANDLER, AZ
(07/2016)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1243 ft. above sea level

Latitude: 33.268

Longitude: -111.812

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	0547	0	FEW120 BKN200	20.00		90	32.0	72	22.1	63	17.0	41	5	150		28.50			M	AA		29.82
29	0647	0	FEW120 SCT200	10.00		90	32.0	72	22.4	64	18.0	42	6	VR		28.52			M	AA		29.84
29	0747	0	FEW200	30.00		91	33.0	74	23.2	66	19.0	44	5	VR		28.54			M	AA		29.86
29	0847	0	SCT200	30.00		95	35.0	74	23.2	64	18.0	36	5	VR		28.54			M	AA		29.86
29	0947	0	FEW200	20.00		97	36.0	74	23.2	63	17.0	33	7	360		28.54			M	AA		29.86
29	1047	0	FEW200	20.00		99	37.0	73	22.9	61	16.0	29	5	060		28.53			M	AA		29.85
29	1147	0	FEW200	10.00		102	39.0	74	23.4	61	16.0	26	8	210		28.50			M	AA		29.82
29	1247	0	CLRs	10.00		102	39.0	74	23.4	61	16.0	26	6	260		28.48			M	AA		29.80
29	1347	0	CLRs	10.00		106	41.0	75	23.9	61	16.0	23	6	300		28.44			M	AA		29.76
29	1447	0	CLRs	10.00		108	42.0	74	23.2	57	14.0	19	6	180		28.40			M	AA		29.72
29	1547	0	CLRs	10.00		109	43.0	74	23.3	57	14.0	18	13	240		28.37			M	AA		29.68
29	1647	0	CLRs	10.00		109	43.0	73	22.8	55	13.0	17	11	240		28.35			M	AA		29.66

Dynamically generated Thu Feb 23 12:06:54 EST 2017 via <http://www.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
PHOENIX DEER VALLEY ARPT (03184)
PHOENIX, AZ
(07/2016)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1455 ft. above sea level

Latitude: 33.688

Longitude: -112.081

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	0053	12	CLR	10.00		96	35.6	68	20.1	52	11.1	23	0	000		28.22			29.68	AA		29.78
29	0153	12	CLR	10.00		96	35.6	72	22.2	60	15.6	30	6	180		28.21			29.67	AA		29.77
29	0253	12	CLR	10.00		95	35.0	72	22.0	60	15.6	31	8	220		28.21			29.68	AA		29.77
29	0353	12	CLR	10.00		94	34.4	72	22.1	61	16.1	33	10	240		28.22			29.69	AA		29.78
29	0446	12	CLR	10.00	TS	92	33.3	71	21.8	61	16.1	36	9	220		28.24			M	SP		29.80
29	0453	12	CLR	10.00	TS	92	33.3	72	22.1	62	16.7	37	9	210		28.25			29.71	AA		29.81
29	0519	12	FEW049	10.00	VCTS	91	32.8	71	21.7	61	16.1	37	14	230		28.26			M	SP		29.82
29	0527	12	FEW047 SCT060 SCT110	10.00	-TSRA	90	32.2	72	22.1	63	17.2	41	14	230		28.26			M	SP		29.82
29	0545	12	SCT039 SCT060	10.00	-RA	86	30.0	72	22.4	66	18.9	51	8	230		28.27			M	SP		29.83
29	0553	12	FEW040 SCT060	10.00		86	30.0	74	23.1	68	20.0	55	9	280		28.28			29.75	AA	0.04	29.84
29	0653	12	CLR	10.00		88	31.1	72	22.4	65	18.3	47	5	230		28.29			29.76	AA		29.85
29	0753	12	CLR	10.00		90	32.2	72	22.1	63	17.2	41	10	240		28.31			29.78	AA		29.87
29	0853	12	CLR	10.00		92	33.3	72	22.4	63	17.2	38	8	240		28.31			29.78	AA		29.87
29	0953	12	CLR	10.00		94	34.4	73	22.7	63	17.2	36	8	200		28.30			29.77	AA		29.86
29	1053	12	CLR	10.00		96	35.6	74	23.0	63	17.2	34	7	200		28.30			29.76	AA		29.86
29	1153	12	CLR	10.00		99	37.2	73	22.9	61	16.1	29	7	250		28.27			29.74	AA		29.83
29	1253	12	CLR	10.00		102	38.9	74	23.3	61	16.1	26	7	220		28.24			29.71	AA		29.80
29	1353	12	CLR	10.00		103	39.4	74	23.2	60	15.6	24	7	VR		28.21			29.67	AA		29.77
29	1453	12	CLR	10.00		106	41.1	75	23.9	61	16.1	23	9	210	17	28.17			29.63	AA		29.72
29	1553	12	CLR	10.00		109	42.8	75	23.7	59	15.0	20	8	210		28.14			29.59	AA		29.69
29	1653	12	CLR	10.00		109	42.8	73	23.0	56	13.3	18	14	210	21	28.12			29.57	AA		29.67
29	1753	12	CLR	10.00		109	42.8	73	22.5	54	12.2	16	10	240		28.10			29.56	AA		29.65
29	1853	12	CLR	10.00		108	42.2	73	22.6	55	12.8	17	9	220		28.12			29.58	AA		29.67
29	1918	12	FEW120	7.00	TS	99	37.2	69	20.6	52	11.1	21	24	020	34	28.18			M	SP		29.74
29	1944	12	FEW004 FEW120	5.00	-TSRA	94	34.4	70	21.0	57	13.9	29	31	040	44	28.18			M	SP		29.74
29	1953	12	CLR	9.00	-TSRA	92	33.3	70	21.0	58	14.4	32	25	040	39	28.18			29.66	AA	T	29.74
29	2015	12	CLR	10.00	VCTS	91	32.8	69	20.6	57	13.9	32	25	030	33	28.20			M	SP		29.75
29	2035	12	CLR	10.00		91	32.8	70	20.8	58	14.4	33	21	110	30	28.25			M	SP		29.81
29	2042	12	CLR	7.00		91	32.8	70	20.8	58	14.4	33	31	120	44	28.26			M	SP		29.82
29	2053	12	CLR	10.00		89	31.7	70	21.1	60	15.6	38	21	130	38	28.29			29.77	AA	T	29.85
29	2153	12	FEW120	10.00		83	28.3	70	21.3	64	17.8	53	18	170	26	28.34			29.82	AA		29.90
29	2253	12	CLR	10.00		81	27.2	70	21.0	64	17.8	56	5	140		28.37			29.85	AA	T	29.93
29	2353	12	FEW085 SCT110	10.00	-RA	81	27.2	71	21.6	66	18.9	60	9	330		28.33			29.80	AA	T	29.89

Dynamically generated Thu Feb 23 12:20:30 EST 2017 via <http://www.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
FALCON FIELD AIRPORT (03185)
MESA, AZ
(07/2016)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1380 ft. above sea level

Latitude: 33.466

Longitude: -111.733

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	1930	0	FEW100 SCT250	10.00		M	M	M	M	M	M	M	34	350	46	28.28			M	AA		29.75
29	1947	0	SCT100 BKN140 BKN250	10.00		M	M	M	M	M	M	M	23	020	34	28.29			M	AA		29.76
29	2018	0	SCT100 BKN140 BKN250	10.00		M	M	M	M	M	M	M	23	060	34	28.37			M	AA		29.84

Dynamically generated Thu Feb 23 12:19:21 EST 2017 via <http://www.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
GLENDALE MUNICIPAL AIRPORT (53126)
GLENDALE, AZ
(07/2016)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1066 ft. above sea level

Latitude: 33.527

Longitude: -112.295

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alt-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	0547	0	SCT100 SCT150 BKN200	20.00		91	33.0	72	22.3	63	17.0	39	11	180	17	28.70		M	AA		29.83	
29	0648	0	FEW100 SCT150 SCT200	20.00		91	33.0	72	22.3	63	17.0	39	11	190	23	28.70		M	AA		29.83	
29	0747	0	FEW100 SCT200	20.00		93	34.0	73	22.9	64	18.0	38	11	190		28.73		M	AA		29.86	
29	0847	0	FEW150 FEW200	20.00		95	35.0	74	23.2	64	18.0	36	14	180		28.73		M	AA		29.86	
29	0947	0	FEW150 FEW200	20.00		97	36.0	74	23.5	64	18.0	34	11	200		28.73		M	AA		29.86	
29	1055	0	FEW150 FEW200	20.00		99	37.0	74	23.5	63	17.0	31	7	200		28.71		M	AA		29.85	
29	1155	0	FEW150 FEW200	20.00		102	39.0	75	23.9	63	17.0	28	9	210	17	28.69		M	AA		29.82	
29	1248	0	FEW150 FEW200	20.00		106	41.0	76	24.5	63	17.0	25	7	190		28.67		M	AA		29.80	
29	1355	0	FEW150 FEW200	M		108	42.0	76	24.2	61	16.0	22	8	190		28.62		M	AA		29.75	
29	1447	0	FEW150 FEW200	20.00		109	43.0	75	23.8	59	15.0	20	13	190	20	28.59		M	AA		29.72	
29	1547	0	FEW150 FEW200	20.00		111	44.0	75	23.6	57	14.0	17	15	180	20	28.55		M	AA		29.68	
29	1647	0	FEW100 FEW150TCU FEW200	20.00		113	45.0	74	23.4	55	13.0	15	13	180	22	28.53		M	AA		29.66	
29	1755	0	FEW100 FEW150TCU SCT200	20.00		113	45.0	74	23.2	54	12.0	14	14	200	18	28.51		M	AA		29.64	
29	1847	0	FEW100 SCT150TCU SCT200	20.00		111	44.0	74	23.1	55	13.0	16	11	190		28.52		M	AA		29.65	
29	1920	0	FEW100 BKN150CB SCT200	20.00s	TS BLDU	109	43.0	74	23.3	57	14.0	18	11	200		28.55		M	AA		29.68	
29	1928	0	BKN120CB BKN180	5.00	TS BLDU	109	43.0	74	23.3	57	14.0	18	23	300	32	28.58		M	AA		29.71	
29	1947	0	BKN120CB OVC180	7.00	TS BLDU	106	41.0	71	21.7	52	11.0	17	24	010	32	28.59		M	AA		29.72	

Dynamically generated Thu Feb 23 12:08:09 EST 2017 via <http://www.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
PHOENIX GOODYEAR AIRPORT (03186)
GOODYEAR, AZ
(07/2016)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 968 ft. above sea level

Latitude: 33.416

Longitude: -112.383

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	0547	0	SCT095 BKN140 BKN200	10.00		91	33.0	72	22.3	63	17.0	39	14	250		28.79		M	AA		29.82	
29	0647	0	SCT110 SCT200	10.00		90	32.0	73	22.5	64	18.0	42	15	240		28.80		M	AA		29.83	
29	0747	0	SCT110 SCT200	10.00		90	32.0	73	22.5	64	18.0	42	9	250		28.83		M	AA		29.86	
29	0847	0	FEW110 SCT200	10.00		93	34.0	73	22.9	64	18.0	38	9	260		28.81		M	AA		29.84	
29	0947	0	SCT110 FEW200	10.00		95	35.0	74	23.2	64	18.0	36	8	250		28.83		M	AA		29.86	
29	1047	0	FEW120 SCT150	10.00		99	37.0	74	23.5	63	17.0	31	14	250		28.82		M	AA		29.85	
29	1147	0	FEW120 SCT180	10.00		99	37.0	74	23.5	63	17.0	31	13	260		28.80		M	AA		29.83	
29	1247	0	FEW120 FEW250	10.00		102	39.0	75	23.9	63	17.0	28	9	250		28.77		M	AA		29.80	
29	1347	0	FEW100 FEW150 SCT250	10.00		104	40.0	75	23.7	61	16.0	24	9	240	16	28.74		M	AA		29.77	
29	1447	0	FEW150 SCT250s	10.00		108	42.0	74	23.2	57	14.0	19	11	240		28.70		M	AA		29.73	
29	1547	0	FEW100 FEW150 SCT200	10.00		109	43.0	74	23.3	57	14.0	18	9	240	17	28.65		M	AA		29.68	
29	1647	0	FEW100 FEW150 SCT200	10.00		109	43.0	74	23.3	57	14.0	18	9	240	17	28.64		M	AA		29.66	
29	1747	0	FEW100 FEW150 SCT220	10.00		111	44.0	75	23.6	57	14.0	17	9	240	18	28.61		M	AA		29.64	
29	1847	0	FEW100 FEW150 SCT220	10.00		109	43.0	74	23.3	57	14.0	18	10	240		28.63		M	AA		29.65	
29	1950	0	SCT100CB BKN150 BKN180	4.00	BLDU	108	42.0	72	22.1	52	11.0	16	16	340	25	28.68		M	AA		29.71	

Dynamically generated Thu Feb 23 12:18:14 EST 2017 via <http://www.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
LUKE AFB AIRPORT (23111)
GLENDALE, AZ
(07/2016)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1085 ft. above sea level

Latitude: 33.55

Longitude: -112.366

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	0058	0	CLR	10.00	TS VCTS	98	36.6	74	23.1	62	16.6	31	3	220		28.59			29.69	AA		29.74
29	0158	0	FEW200 SCT220	10.00		96	35.7	73	22.8	62	16.5	32	10	230		28.58			29.67	AA		29.73
29	0258	0	SCT210	10.00		95	35.1	73	22.9	63	17.2	35	15	210		28.58			29.67	AA		29.73
29	0358	0	SCT160	10.00		94	34.3	73	22.8	63	17.1	36	15	210		28.60			29.70	AA		29.75
29	0416	0	BKN160	10.00		93	34.0	73	22.6	63	17.0	37	13	210		28.61			M	AA		29.76
29	0431	0	BKN160	10.00		93	34.0	73	22.6	63	17.0	37	21	220		28.61			M	AA		29.76
29	0458	0	SCT160	10.00		93	33.9	73	22.6	63	17.3	37	15	200		28.64			29.74	AA		29.79
29	0558	0	SCT160	10.00		92	33.3	73	22.5	63	17.0	38	16	210		28.65			29.75	AA		29.80
29	0658	0	CLR	10.00		91	32.6	73	22.6	64	17.8	41	20	230	28	28.66			29.76	AA		29.81
29	0758	0	CLR	10.00		92	33.6	73	22.8	64	17.8	40	20	220		28.69			29.79	AA		29.84
29	0858	0	CLR	10.00		94	34.7	74	23.1	64	17.9	37	15	210		28.68			29.78	AA		29.83
29	0958	0	CLR	10.00		98	36.4	75	23.7	64	17.6	33	15	230		28.68			29.78	AA		29.83
29	1058	0	CLR	10.00		100	37.7	75	23.9	64	17.7	31	14	210		28.67			29.77	AA		29.82
29	1158	0	CLR	10.00		103	39.3	76	24.3	64	17.5	28	9	190		28.65			29.75	AA		29.80
29	1258	0	CLR	10.00		105	40.7	76	24.3	63	17.2	26	10	220	18	28.62			29.72	AA		29.77
29	1304	0	CLR	10.00		106	41.0	76	24.5	63	17.0	25	13	240	18	28.61			M	AA		29.76
29	1328	0	CLR	10.00		108	42.0	76	24.2	61	16.0	22	11	240	20	28.60			M	AA		29.75
29	1348	0	CLR	10.00		108	42.0	77	24.7	63	17.0	23	15	220	24	28.58			M	AA		29.73
29	1358	0	CLR	10.00		108	42.2	76	24.2	61	16.2	22	15	200	24	28.57			29.67	AA		29.72
29	1359	0	CLR	10.00		108	42.0	77	24.7	63	17.0	23	14	180	21	28.57			M	AA		29.72
29	1402	0	CLR	10.00		108	42.0	76	24.2	61	16.0	22	16	220	21	28.57			M	AA		29.72
29	1458	0	CLR	10.00		110	43.3	75	23.7	58	14.7	18	14	210		28.54			29.64	AA		29.69
29	1558	0	CLR	10.00		111	44.0	74	23.3	56	13.4	17	14	230	24	28.50			29.59	AA		29.65
29	1559	0	CLR	10.00		111	44.0	74	23.1	55	13.0	16	13	250	24	28.50			M	AA		29.65
29	1658	0	CLR	10.00		111	44.1	73	22.9	54	12.1	15	13	230	17	28.48			29.57	AA		29.63
29	1758	0	CLR	10.00		112	44.2	74	23.3	55	12.6	15	15	260		28.47			29.57	AA		29.62
29	1858	0	CLR	10.00		110	43.6	73	22.8	54	12.1	16	10	250		28.49			29.59	AA		29.64
29	1929	0	FEW004 SCT140	5.00	HZ	108	42.0	72	22.0	52	11.0	16	22	360	29	28.55			M	AA	T	29.70
29	1931	0	FEW004 SCT140	4.00	HZ	108	42.0	72	22.0	52	11.0	16	21	010	29	28.56			M	AA	T	29.71
29	1941	0	BKN005 BKN140	2.00	HZ	104	40.0	71	21.9	54	12.0	19	25	030	44	28.55			M	AA	T	29.70
29	1942	0	CLR	1.00		104	40.0	M	M	54	12.0	M	30	040	44	M			M	AA	T	29.69
29	1943	0	CLR	0.75		104	40.0	M	M	54	12.0	M	37	030	52	M			M	AA	T	29.69
29	1944	0	CLR	0.75		104	40.0	M	M	54	12.0	M	39	030	52	M			M	AA	T	29.70
29	1954	0	SCT005 SCT140	1.75	-TSRA	102	39.0	71	21.6	54	12.0	20	25	040	43	28.56			M	AA	T	29.71
29	1958	0	SCT005	5.00	-TSRA	102	39.0	71	21.6	54	12.0	20	29	030	43	28.56			29.66	AA	T	29.71
29	1959	0	SCT005	8.00	VCTS	102	39.0	71	21.6	54	12.0	20	29	030	38	28.56			M	AA	T	29.71
29	2004	0	FEW005	10.00	-DZ VCTS	100	38.0	72	22.0	57	14.0	24	23	030	37	28.56			M	AA		29.71
29	2006	0	FEW004	10.00	-DZ	100	38.0	73	22.5	59	15.0	26	21	030	36	28.56			M	AA		29.71
29	2008	0	CLR	10.00		99	37.0	72	22.4	59	15.0	27	21	030		28.55			M	AA		29.70
29	2036	0	BKN130	10.00		100	38.0	71	21.5	55	13.0	22	24	090		28.62			M	AA		29.77
29	2050	0	SCT002 OVC130	1.50		100	38.0	M	M	61	16.0	M		M		M			M	AA		M
29	2058	0	SCT002 BKN130	1.25	BLDU	100	37.9	M	M	60	15.6	M	69	120	96s	M			M	AA		M
29	2136	0	CLR	M		81	27.0s	73	23.0	70	21.0s	69	26s	160	36	28.72			M	AA		29.88
29	2138	0	CLR	7.00		81	27.0s	73	23.0	70	21.0	69	26	160	36	28.72			M	AA		29.88
29	2158	0	SCT130	10.00	VCTS	81	27.0s	71	21.6	66	19.1	60	16	130		28.75			29.87s	AA		29.91s
29	2256	0	CLR	10.00	TS	86	30.0	71	21.8	64	18.0	48	5	170	22	28.74			M	AA		29.89
29	2258	0	CLR	10.00	TS	85	29.7	71	21.4	63	17.4	48	2	180	22	28.74			29.84	AA		29.89
29	2259	0	CLR	10.00	-TSRA	86	30.0	71	21.5	63	17.0	46	2	320		28.74			M	AA		29.90
29	2311	0	CLR	10.00		86	30.0	71	21.5	63	17.0	46	3	VR		28.74			M	AA	T	29.90
29	2358	0	CLR	10.00		87	30.5	71	21.4	62	16.7	43	10	090		28.69			29.79	AA	T	29.84

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
SCOTTSDALE AIRPORT (03192)
SCOTTSDALE, AZ
(07/2016)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1473 ft. above sea level

Latitude: 33.622

Longitude: -111.910

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	0053	12	CLR	10.00	VCTS	97	36.1	70	21.0	55	12.8	24	3	220		28.20			29.70	AA		29.79
29	0153	12	CLR	10.00		97	36.1	71	21.5	57	13.9	26	0	000		28.20			29.69	AA		29.79
29	0253	12	CLR	10.00		96	35.6	72	22.4	61	16.1	31	3	300		28.21			29.70	AA		29.80
29	0353	12	CLR	10.00		96	35.6	72	22.4	61	16.1	31	0	000		28.21			29.70	AA		29.80
29	0453	12	CLR	10.00		94	34.4	72	22.1	61	16.1	33	7	250		28.24			29.73	AA		29.83
29	0530	12	CLR	10.00		93	33.9	72	22.0	61	16.1	34	10	250		28.25		M	SP			29.84
29	0545	12	CLR	10.00		92	33.3	71	21.8	61	16.1	36	10	250		28.26		M	SP			29.85
29	0553	12	CLR	10.00		92	33.3	71	21.8	61	16.1	36	6	VR		28.27			29.76	AA		29.86
29	0653	12	CLR	10.00		92	33.3	71	21.8	61	16.1	36	5	VR		28.27			29.78	AA		29.87
29	0753	12	CLR	10.00		93	33.9	72	22.0	61	16.1	34	8	230		28.29			29.79	AA		29.89
29	0853	12	CLR	10.00		93	33.9	72	22.3	62	16.7	36	7	230		28.29			29.79	AA		29.89
29	0953	12	CLR	10.00		94	34.4	72	22.4	62	16.7	35	0	000		28.28			29.79	AA		29.88
29	1053	12	CLR	10.00		97	36.1	73	22.9	62	16.7	31	0	000		28.27			29.77	AA		29.87
29	1153	12	CLR	10.00		100	37.8	74	23.0	61	16.1	28	5	240		28.26			29.75	AA		29.85
29	1253	12	CLR	10.00		102	38.9	74	23.0	60	15.6	25	8	260		28.24			29.73	AA		29.83
29	1353	12	CLR	10.00		104	40.0	74	23.1	59	15.0	23	10	240		28.20			29.69	AA		29.79
29	1453	12	CLR	10.00		106	41.1	74	23.1	58	14.4	21	8	250		28.16			29.65	AA		29.75
29	1553	12	CLR	10.00		108	42.2	74	23.1	57	13.9	19	9	250	16	28.13			29.62	AA		29.72
29	1653	12	CLR	10.00		109	42.8	73	23.0	56	13.3	18	9	270		28.10			29.59	AA		29.69
29	1753	12	CLR	10.00		109	42.8	72	22.3	53	11.7	16	10	230		28.09			29.58	AA		29.68
29	1853	12	CLR	10.00		108	42.2	72	22.2	53	11.7	16	6	200		28.12			29.61	AA		29.71
29	1925	12	CLR	10.00	VCTS TS	101	38.3	70	20.9	52	11.1	19	31s	050	37	28.17		M	SP			29.76
29	1932	12	FEW120	10.00		100	37.8	70	21.2	54	12.2	21	25	040	37	28.17		M	SP			29.76
29	1953	12	FEW090 BKN120	10.00	-TSRA	98	36.7	71	21.4	56	13.3	25	13	030	39	28.20			29.69	AA	T	29.79
29	2015	12	FEW080 BKN120	8.00	TSRA	91	32.8	72	22.0	62	16.7	38	14	110	21	28.25		M	SP			29.84
29	2046	12	SCT050 BKN070 BKN120	10.00	VCTS -RA	82	27.8	72	22.1	67	19.4	61	13	160	24	28.27		M	SP			29.87
29	2053	12	SCT050 BKN080 BKN120	10.00	VCTS -RA	82	27.8	72	22.1	67	19.4	61	13	150	22	28.27			29.79	AA	0.14	29.87
29	2137	12	CLR	10.00		82	27.8	72	22.1	67	19.4	61	9	140	20	28.34		M	SP			29.94
29	2153	12	FEW085	10.00		80	26.7	72	22.1	68	20.0	67	11	150		28.33			29.85	AA	0.01	29.93
29	2253	12	CLR	10.00		79	26.1	72	21.9	68	20.0	69	6	080		28.35			29.86	AA		29.95
29	2353	12	FEW120	10.00		81	27.2	72	21.9	67	19.4	63	6	340		28.28			29.79	AA	T	29.88

Dynamically generated Thu Feb 23 12:24:39 EST 2017 via <http://www.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
PHOENIX SKY HARBOR INTL AIRPORT (23183)
PHOENIX, AZ
(07/2016)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1107 ft. above sea level

Latitude: 33.427

Longitude: -112.003

Data Version: VER3

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	0051	11	SCT130 SCT250	10.00		101	38.3	74	23.2	61	16.1	27	3	290		28.57			29.67	AA		29.74
29	0151	11	SCT130 BKN230	10.00		100	37.8	74	23.4	62	16.7	29	8	280		28.57			29.66	AA		29.74
29	0251	11	SCT130 BKN210	10.00		98	36.7	74	23.1	62	16.7	31	6	270		28.57			29.66	AA		29.74
29	0351	11	BKN130 BKN210	10.00		98	36.7	74	23.1	62	16.7	31	8	310		28.58			29.67	AA		29.75
29	0451	11	SCT130 BKN210	10.00		95	35.0	73	22.9	63	17.2	35	7	250		28.61			29.71	AA		29.78
29	0551	11	FEW100 SCT130 SCT180	10.00		94	34.4	72	22.2	61	16.1	33	20	270		28.63			29.73	AA		29.80
29	0651	11	FEW120 FEW160 SCT230	10.00		93	33.9	72	22.3	62	16.7	36	10	300		28.65			29.75	AA		29.82
29	0751	11	FEW120 FEW160	10.00		94	34.4	73	22.5	62	16.7	35	13	290		28.66			29.76	AA		29.83
29	0851	11	FEW120 FEW160	10.00		96	35.6	73	22.8	62	16.7	32	14	280		28.66			29.77	AA		29.84
29	0951	11	FEW120 FEW160 SCT250	10.00		98	36.7	74	23.1	62	16.7	31	13	300		28.66			29.76	AA		29.83
29	1051	11	FEW160 FEW250	10.00		99	37.2	74	23.2	62	16.7	30	3	VR		28.65			29.75	AA		29.82
29	1151	11	FEW160 SCT250	10.00		103	39.4	75	23.8	62	16.7	26	10	270		28.63			29.73	AA		29.80
29	1251	11	FEW095 FEW160 SCT250	10.00		104	40.0	75	23.6	61	16.1	24	9	310		28.61			29.70	AA		29.78
29	1351	11	FEW095 FEW160 SCT250	10.00		108	42.2	76	24.2	61	16.1	22	13	250	17	28.57			29.66	AA		29.74
29	1451	11	FEW095 FEW160 SCT250	10.00		108	42.2	74	23.4	58	14.4	19	9	270	17	28.53			29.62	AA		29.70
29	1551	11	FEW095 FEW160 SCT250	10.00		110	43.3	75	23.7	58	14.4	18	15	300	24	28.49			29.59	AA		29.66
29	1651	11	FEW100 FEW160 SCT250	10.00		111	43.9	73	22.7	53	11.7	15	16	270		28.47			29.57	AA		29.64
29	1751	11	FEW100 FEW160 SCT250	10.00		110	43.3	73	23.0	55	12.8	16	11	270		28.46			29.56	AA		29.63
29	1851	11	FEW100 SCT160 BKN250	10.00		110	43.3	73	22.8	54	12.2	16	11	260		28.48			29.57	AA		29.65
29	1937	11	SCT100CB BKN140 BKN250	10.00	TS	108	42.2	73	22.7	55	12.8	17	8	200		28.50			M	SP		29.67
29	1951	11	SCT100CB BKN140 BKN250	10.00	TS	108	42.2	73	22.7	55	12.8	17		350		28.53			29.63	AA		29.70
29	2018	11	FEW055 SCT095CB	1.00		79	26.1	74	23.0	71	21.7s	77	39	070	70	28.66			M	SP		29.83
29	2030	11	SCT026 BKN110CB OVC140	2.00	TSRA	79	26.1	72	22.3	69	20.6	72	24	120	51	28.69			M	SP		29.87
29	2051	11	SCT043 OVC080CB	2.00	+TSRA	78	25.6s	73	22.8	71	21.7s	79	21	140	30	28.70			29.82	AA	0.50	29.88
29	2102	11	BKN055 OVC075CB	4.00	TSRA	78	25.6s	73	22.8	71	21.7	79	22	160	30	28.68			M	SP		29.85
29	2123	11	SCT055 BKN075 BKN130	10.00		79	26.0s	73	22.7	70	21.0	74	24	170	39	28.66			M	SP		29.84
29	2151	11	BKN075 OVC130	10.00	-RA	81	27.0	72	22.3	68	20.0	65	24	180	38	28.71			29.83s	AA	0.03	29.89
29	2155	11	BKN075CB OVC130	10.00	-TSRA	79	26.0s	72	22.0	68	20.0	69	26	180	38	28.73			M	SP		29.91s
29	2234	11	FEW070 BKN120 OVC250	10.00	-RA	80	26.7s	72	22.1	68	20.0	67	20	160	32	28.69			M	SP		29.87
29	2251	11	FEW070 BKN120 OVC250	10.00	-RA	83	28.3	70	21.3	64	17.8	53	22	170	32	28.69			29.80	AA	T	29.86
29	2351	11	SCT070 OVC110	10.00		86	30.0	71	21.5	63	17.2	46	7	VR		28.66			29.76	AA	T	29.83

Dynamically generated Thu Feb 23 12:23:27 EST 2017 via <http://www.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
WILLIAMS GATEWAY AIRPORT (23104)
PHOENIX, AZ
(07/2016)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 1382 ft. above sea level

Latitude: 33.3

Longitude: -111.666

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29	0015	0	CLR	10.00		91	33.0	68	19.8	54	12.0	29	6	190		28.32			M	AA		29.78
29	0035	0	CLR	10.00		91	33.0	68	20.0	55	13.0	30	6	190		28.32			M	AA		29.78
29	0055	0	CLR	10.00		91	33.0	68	20.0	55	13.0	30	5	290		28.32			M	AA		29.78
29	0115	0	CLR	10.00		91	33.0	68	20.0	55	13.0	30	0	000		28.32			M	AA		29.78
29	0135	0	CLR	10.00		91	33.0	68	20.0	55	13.0	30	0	000		28.32			M	AA		29.78
29	0155	0	CLR	10.00		91	33.0	68	20.0	55	13.0	30	0	000		28.32			M	AA		29.78
29	0215	0	CLR	10.00		90	32.0	68	19.9	55	13.0	31	0	000		28.32			M	AA		29.78
29	0235	0	CLR	10.00		90	32.0	68	19.9	55	13.0	31	3	090		28.32			M	AA		29.78
29	0255	0	CLR	10.00		90	32.0	68	19.9	55	13.0	31	6	120		28.32			M	AA		29.78
29	0315	0	CLR	10.00		88	31.0	68	20.1	57	14.0	35	5	150		28.32			M	AA		29.78
29	0335	0	CLR	10.00		88	31.0	68	20.1	57	14.0	35	0	000		28.33			M	AA		29.79
29	0355	0	CLR	10.00		88	31.0	69	20.6	59	15.0	38	5	170		28.33			M	AA		29.79
29	0415	0	CLR	10.00		88	31.0	69	20.6	59	15.0	38	6	150		28.34			M	AA		29.80
29	0435	0	CLR	10.00		88	31.0	67	19.5	55	13.0	33	0	000		28.36			M	AA		29.82
29	0447	0	FEW100	20.00		88	31.0	68	20.1	57	14.0	35	5	060		28.37			M	AA		29.83
29	0547	0	FEW250	45.00		88	31.0	68	20.1	57	14.0	35	9	080		28.39			M	AA		29.85
29	0647	0	FEW250	45.00		88	31.0	72	22.1	64	18.0	45	9	100		28.41			M	AA		29.87
29	0747	0	FEW250	45.00		90	32.0	72	22.4	64	18.0	42	9	110		28.41			M	AA		29.87
29	0847	0	FEW250	45.00		93	34.0	73	22.9	64	18.0	38	5	120		28.42			M	AA		29.88
29	0947	0	FEW150	30.00		95	35.0	73	22.9	63	17.0	35	5	VR		28.41			M	AA		29.87
29	1047	0	FEW120	30.00		97	36.0	74	23.2	63	17.0	33	5	VR		28.41			M	AA		29.87
29	1151	0	FEW120	30.00		99	37.0	74	23.5	63	17.0	31	5	VR		28.39			M	AA		29.85
29	1247	0	FEW120	45.00		100	38.0	75	23.6	63	17.0	30	6	310		28.36			M	AA		29.82
29	1350	0	FEW120	45.00		104	40.0	76	24.1	63	17.0	26	7	310		28.32			M	AA		29.78
29	1447	0	FEW250	45.00		106	41.0	75	23.9	61	16.0	23	7	230	17	28.29			M	AA		29.75
29	1547	0	FEW250	45.00		108	42.0	75	23.6	59	15.0	20	14	260		28.25			M	AA		29.71
29	1747	0	SCT200	45.00		108	42.0	74	23.1	57	14.0	19	27	300		28.22			M	AA		29.68
29	1852	0	BKN250	2.06		108	42.0	72	22.4	54	12.0	17		M		28.26			M	AA		29.72
29	1936	0	BKN006 BKN008 OVC120	0.50		99	37.0	70	21.3	55	13.0	23	60	100	90s	28.31			M	AA		29.77
29	1950	0	OVC002	0.50		99	37.0	70	21.3	55	13.0	23	39s	110	51	28.31			M	AA		29.77
29	2020	0	OVC010	5.00		82	28.0	71	21.8	66	19.0	58	47	160	58	28.45			M	AA		29.91
29	2051	0	SCT008 OVC015	5.00		79	26.0	73	22.7	70	21.0	74	13	140	34	28.49			M	AA		29.96
29	2123	0	OVC120	5.00		79	26.0	73	22.7	70	21.0	74	11	150		28.49			M	AA		29.96
29	2147	0	OVC090	10.00		79	26.0	73	22.7	70	21.0	74	16	170	22	28.50			M	AA		29.97s
29	2247	0	OVC120	20.00		79	26.0	73	22.7	70	21.0	74	16	180		28.45			M	AA		29.91
29	2347	0	OVC120	20.00		81	27.0	71	21.6	66	19.0	60	29	020	36	28.40			M	AA		29.86

Dynamically generated Thu Feb 23 12:21:35 EST 2017 via <http://www.ncdc.noaa.gov/qclcd/QCLCD>

NWS SRRS PRODUCTS FOR:
2016072907 to 2016073007

WWUS75 KPSR 291638

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

938 AM MST FRI JUL 29 2016

...DENSE BLOWING DUST POSSIBLE...

AZZ027-028-300300-

/O.NEW.KPSR.DU.Y.0025.160729T2100Z-160730T0300Z/

SOUTHWEST MARICOPA COUNTY-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...GILA BEND...APACHE JUNCTION...

CASA GRANDE...COOLIDGE...FLORENCE

938 AM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY IN EFFECT FROM 2 PM THIS AFTERNOON TO
8 PM MST THIS EVENING...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A BLOWING DUST
ADVISORY...WHICH IS IN EFFECT FROM 2 PM THIS AFTERNOON TO 8 PM
MST THIS EVENING.

* AFFECTED AREA...MUCH OF SOUTH-CENTRAL ARIZONA INCLUDING THE
INTERSTATE 10 AND INTERSTATE 8 CORRIDORS FROM CASA GRANDE AND GILA
BEND.

* TIMING...LATE THIS AFTERNOON THROUGH PINAL COUNTY SPREADING NORTH
AND WEST TOWARDS PHOENIX DURING THE EARLY EVENING.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...BELOW 1 MILE WILL BE COMMON.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST
REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING DUST IS ALSO
POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER
BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT
APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR
VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR
FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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AZZ022-023-026-300300-

/O.NEW.KPSR.DU.Y.0025.160730T0000Z-160730T0300Z/

NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-SOUTHWEST DESERTS-

INCLUDING THE CITIES OF...BUCKEYE...LAKE PLEASANT...MORRISTOWN...

NEW RIVER...TONOPAH...WICKENBURG...CAREFREE...CAVE CREEK...

CHANDLER...FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA...

PHOENIX...SCOTTSDALE...SUN CITY...TEMPE...DATELAND...TACNA...

WELLTON

938 AM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY IN EFFECT FROM 5 PM THIS AFTERNOON TO
8 PM MST THIS EVENING...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A BLOWING DUST
ADVISORY...WHICH IS IN EFFECT FROM 5 PM THIS AFTERNOON TO 8 PM
MST THIS EVENING.

* AFFECTED AREA...MUCH OF SOUTH-CENTRAL ARIZONA INCLUDING THE
INTERSTATE 10 AND INTERSTATE 8 CORRIDORS FROM PHOENIX TO CASA

GRANDE AND GILA BEND.

- * TIMING...LATE THIS AFTERNOON THROUGH PINAL COUNTY SPREADING NORTH AND WEST THROUGH PHOENIX DURING THE EARLY EVENING.
- * WINDS...GUSTS OVER 40 MPH LIKELY.
- * VISIBILITY...BELOW 1 MILE WILL BE COMMON.
- * IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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FXUS65 KPSR 292100

AFDPSR

Area Forecast Discussion

National Weather Service Phoenix AZ

200 PM MST FRI JUL 29 2016

.SYNOPSIS...

A much more humid airmass will move into the Desert Southwest this weekend, causing a modest drop in temperatures. There will be a marked increase in thunderstorm activity beginning this evening and continuing into next week. All typical hazards associated with the monsoon season including strong damaging winds, blowing dust, lightning, and localized flooding will be in play.

&&

.DISCUSSION...

Conditions continue to evolve toward a very active, high impact weather situation across central Arizona this evening and tonight. Regional objective analysis shows the H5 anti-cyclone gradually weakening and shifting east towards the four corners. Per WV imagery, there appears to be a subtle wave on the eastern periphery of this midtropospheric high pressure over west-central/southwest NM, and visible imagery shows rapid manifestation of midlevel clouds in response to this feature (and possibly encapsulating a gravity wave as well). Convection over the White Mountains already shows rather organized outflow and very solid coverage. Given these features, its not surprising that modest cooling and moistening of the middle atmosphere is forecast for the remainder of the day per forecast sounding data.

NCAR and SSEO ensemble output along with almost every local high resolution model resoundingly suggests intense outflow winds/boundaries developing from high terrain convection propagating towards lower elevations. Deep outflow boundaries (and numerous collisions) should be sufficient to spur additional convection helping re-enforce strong surface winds leading to expansive dense blowing dust. Ensemble mean probabilities for sfc winds greater than 30-40kt across the Phoenix metro are about as high as typically ever seen during monsoon season. Given the relatively high confidence, a blowing dust advisory remains in effect as a watch type product leading into this presumptive large event.

In addition to expansive dense blowing dust, severe weather remains a distinct possibility as well with forecast soundings indicating outflow mixing 11 g/kg of moisture in a sfc-600mb layer resulting in the localized release of 1500 J/kg energy with any better perturbation. Unusually steep H7-H5 lapse rates near 8 C/km will be juxtaposed with DCape values near 2000 J/kg indicative of both severe hail and wind potential. Probably the main uncertainty is how extensive the deeper convective cells will spread across the forecast area. but certainly the opportunity exists for a significant event given the underlying parameters. Activity Saturday may become highly dependent on evolution of outflow and convection tonight; and much of the forecast model output indicates very delayed build up of instability Saturday afternoon. In fact, forecast soundings show the typical convectively overturned environment during the morning, then a subsident capping inversion/elevated mixed layer developing near 700mb during the afternoon. Ensemble mean probabilities and high resolution output correspondingly are rather muted in convective response into the early evening, though show a far more robust response into the late evening overnight. A vast majority of model output still latches onto a well defined inverted trough/shortwave Saturday night while at the same time surges an anomalously high theta-e airmass northward towards central Arizona. POPs remain quite high during the Sunday morning time frame with the potential for locally heavy rain. Consequently, residual cloud cover through the daylight hours Sunday may very well keep temperatures over central Arizona well retarded while shifting convective activity westward.

Monday through Thursday...

1000-700 mb mean mixing ratios remain in the 10-12 g/kg through at least Tuesday, keeping above-climo rain chances in the forecast. GFS trends toward a slow decline of moisture beginning Wednesday and especially Thursday (GEM starts drying on Monday). This is reflected in a gradual eastward retreat PoPs from NAEFS and ESRL output. ECMWF however holds on to moisture longer as it stalls out an inverted trough over Arizona. Thus held on to PoPs over south- central AZ through Thursday. Temperatures during the week will trend slowly upward.

&&

.AVIATION...

South-Central Arizona Including KPHX, KIWA, and KSDL:

Westerly winds to prevail through the late afternoon hours with stronger winds (sustained speeds as high as 12 kts) during the mid-late afternoon hours today.

Latest high-res computer models are now in much better agreement on the idea that thunderstorms developing over the higher terrain east of Phoenix, at least sending strong outflow winds this evening into the Greater Phoenix Area during the 01Z-02Z hours. This will likely affecting all of the Phx area taf sites with even a decent chance for the storms themselves affecting one or more of the taf sites. Wind speeds of at least 25 kts, with gusts as high as 35 kts look likely, with even stronger speeds possible along with blowing dust reducing visibilities. Heavy downpours and even small hail are possible if thunderstorms do actually reach the terminal(s). Winds will become light easterly later this evening, once the storms move through. Southeast California/Southwest Arizona including KIPL and KBLH: Should be another quiet taf period at KIPL, with little chance of any isolated showers or storms, and winds remaining from a

southeasterly direction.

Winds will continue to favor southerly directions and wind speeds at KBLH through this evening, with stronger winds during the late afternoon/evening hours. There is fairly high confidence that outflows from thunderstorms over South-Central AZ will affect KBLH for a time later this evening, with winds becoming gusty from an easterly direction along with some blowing dust possible.

Aviation Discussion not updated for amended TAFs.

&&

.FIRE WEATHER...

Monday through Friday...

Deep southerly to southeasterly flow aloft is expected to push copious amounts of monsoon moisture into the region, resulting in scattered to numerous thunderstorms Monday through Wednesday with good to excellent chances for at least some wetting rains and locally gusty winds. The combination of considerable cloudiness and rainfall will also keep temperatures below normal during this period, and humidities above normal. A shift to more westerly winds aloft is then expected to gradually reduce moisture levels, and chances for wetting rains during the Thursday-Friday period, while allowing temperatures to return to near-normal levels. Minimum humidities in the 25-45 percent range in the Monday-Wednesday period to drop into the 20-35 percent range by Friday, with good-excellent overnight recoveries. Outside of thunderstorms, winds to mainly follow typical diurnal trends.

&&

.SPOTTER INFORMATION STATEMENT...

Spotter activation is possible this evening and Saturday.

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.PSR WATCHES/WARNINGS/ADVISORIES...

AZ...Blowing Dust Advisory from 2 PM this afternoon to 8 PM MST this evening for AZZ027-028.

Blowing Dust Advisory from 5 PM this afternoon to 8 PM MST this evening for AZZ022-023-026.

CA...None.

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Visit us on Facebook...Twitter...and at weather.gov/phoenix

DISCUSSION...MO/AJ

AVIATION...Percha

FIRE WEATHER...Percha

WWUS75 KPSR 300028

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

528 PM MST FRI JUL 29 2016

...DENSE BLOWING DUST POSSIBLE...

AZZ022-023-026-300500-

/O.CAN.KPSR.DU.Y.0025.000000T0000Z-160730T0300Z/

/O.NEW.KPSR.DU.Y.0026.160730T0200Z-160730T0500Z/

NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-SOUTHWEST DESERTS-
INCLUDING THE CITIES OF...BUCKEYE...LAKE PLEASANT...MORRISTOWN...
NEW RIVER...TONOPAH...WICKENBURG...CAREFREE...CAVE CREEK...
CHANDLER...FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA...
PHOENIX...SCOTTSDALE...SUN CITY...TEMPE...DATELAND...TACNA...

WELLTON

528 PM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY IN EFFECT UNTIL 10 PM MST THIS EVENING...
THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A BLOWING DUST
ADVISORY...WHICH IS IN EFFECT UNTIL 10 PM MST THIS EVENING.

- * AFFECTED AREA...MUCH OF NORTHERN MARICOPA AND YUMA
COUNTIES...INCLUDING THE PHOENIX AREA.
- * TIMING...LATER THIS EVENING.
- * WINDS...GUSTS OVER 40 MPH LIKELY.
- * VISIBILITY...BELOW 1 MILE WILL BE COMMON.
- * IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING
DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING
DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER
BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT
APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR
VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR
FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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AZZ027-028-300400-

/O.EXT.KPSR.DU.Y.0025.000000T0000Z-160730T0400Z/

SOUTHWEST MARICOPA COUNTY-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...GILA BEND...APACHE JUNCTION...

CASA GRANDE...COOLIDGE...FLORENCE

528 PM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY NOW IN EFFECT UNTIL 9 PM MST THIS
EVENING...

- * AFFECTED AREA...MUCH OF SOUTH-CENTRAL ARIZONA INCLUDING THE
INTERSTATE 10 AND INTERSTATE 8 CORRIDORS FROM CASA GRANDE AND
GILA BEND.
- * TIMING...EARLY THIS EVENING THROUGH PINAL COUNTY SPREADING NORTH
AND WEST THROUGH THE AREA.
- * WINDS...GUSTS OVER 40 MPH LIKELY.
- * VISIBILITY...BELOW 1 MILE WILL BE COMMON.
- * IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING
DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING
DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER
BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT
APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR
VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR
FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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WWUS75 KPSR 300221

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

721 PM MST FRI JUL 29 2016

...DENSE BLOWING DUST POSSIBLE...

AZZ022-023-300400-

/O.EXT.KPSR.DU.Y.0026.000000T0000Z-160730T0400Z/

NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-

INCLUDING THE CITIES OF...BUCKEYE...LAKE PLEASANT...MORRISTOWN...

NEW RIVER...TONOPAH...WICKENBURG...CAREFREE...CAVE CREEK...

CHANDLER...FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA...

PHOENIX...SCOTTSDALE...SUN CITY...TEMPE

721 PM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY NOW IN EFFECT UNTIL 9 PM MST THIS EVENING...

* AFFECTED AREA...NORTHERN MARICOPA COUNTY.

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...BELOW 1 MILE WILL BE COMMON.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER

BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT

APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR

VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR

FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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AZZ027-028-300400-

/O.CON.KPSR.DU.Y.0025.000000T0000Z-160730T0400Z/

SOUTHWEST MARICOPA COUNTY-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...GILA BEND...APACHE JUNCTION...

CASA GRANDE...COOLIDGE...FLORENCE

721 PM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY REMAINS IN EFFECT UNTIL 9 PM MST THIS EVENING...

* AFFECTED AREA...MUCH OF SOUTH-CENTRAL ARIZONA INCLUDING THE INTERSTATE 10 AND INTERSTATE 8 CORRIDORS FROM CASA GRANDE AND GILA BEND.

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...BLOWING DUST IS PRODUCING VISIBILITIES BELOW 1 MILE. VISIBILITIES AS LOW ONE HALF OF A MILE ARE POSSIBLE.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER

BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT

APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR

VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR

FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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NWUS55 KPSR 300220

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

720 PM MST FRI JUL 29 2016

..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE....
..REMARKS..
0705 PM TSTM WND GST 5 WNW FLORENCE 33.06N 111.46W
07/29/2016 U55 MPH PINAL AZ TRAINED SPOTTER
AND VSBY LESS THAN 1 MI. IN DUST.

&&

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JS

NWUS55 KPSR 300225

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

725 PM MST FRI JUL 29 2016

..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE....
..REMARKS..
0713 PM DUST STORM 7 SE QUEEN CREEK 33.17N 111.56W
07/29/2016 PINAL AZ TRAINED SPOTTER
VSBY LESS THAN 1/4 MI. .

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JS

WWUS85 KPSR 300226

SPSPSR

SPECIAL WEATHER STATEMENT

NATIONAL WEATHER SERVICE PHOENIX AZ

726 PM MST FRI JUL 29 2016

AZZ022>024-027-028-300330-

GREATER PHOENIX AREA AZ-NORTHWEST MARICOPA COUNTY AZ-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY AZ-

SOUTHERN GILA/TONTO NF FOOTHILLS AZ-SOUTHWEST MARICOPA COUNTY AZ-

726 PM MST FRI JUL 29 2016

...SIGNIFICANT WEATHER ADVISORY...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A

SIGNIFICANT WEATHER ADVISORY FOR...

NORTHWESTERN GILA...NORTHEASTERN MARICOPA AND NORTHWESTERN PINAL
COUNTIES

UNTIL 830 PM MST

AT 722 PM MST...DOPPLER RADAR WAS TRACKING A STRONG THUNDERSTORM
OUTFLOW BOUNDARY MOVING SOUTH THROUGH THE PHOENIX METROPOLITAN AREA.
IN ADDITION TO THE OUTFLOW WINDS...SHOWER AND THUNDERSTORM
DEVELOPMENT IS OCCURRING IN THE WAKE OF THE OUTFLOW. NORTHERLY
OUTFLOW WINDS WERE MOVING SOUTH AT 20 MPH...BUT RADAR SAMPLED WINDS
JUST OFF THE SURFACE WERE NEAR 50 MPH. DENSE BLOWING DUST IS
POSSIBLE ACROSS THE ADVISORY AREA...WITH VISIBILITIES DROPPING BELOW
1 MILE AT TIMES.

WIND GUSTS UP TO 50 MPH WILL BE POSSIBLE WITH THESE OUTFLOW WINDS IN
ADDITION TO ADDITIONAL STORMS THAT DEVELOP IN THE WAKE OF THE
OUTFLOW.

LOCATIONS IMPACTED INCLUDE...
PHOENIX...MESA...CHANDLER...GLENDALE...SCOTTSDALE...GILBERT...
TEMPE...PEORIA...SURPRISE...AVONDALE...GOODYEAR...BUCKEYE...
APACHE JUNCTION...EL MIRAGE...FOUNTAIN HILLS...PARADISE VALLEY...
COOLIDGE...TOLLESON...YOUNGTOWN AND SUNFLOWER.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
LOCALLY DENSE BLOWING DUST IS POSSIBLE. IF YOU ENCOUNTER BLOWING
DUST WHILE DRIVING...PULL OVER AS FAR OFF THE ROADWAY AS POSSIBLE AND
PARK. TURN OFF YOUR HEADLIGHTS AND KEEP YOUR FOOT OFF THE BRAKE.
THIS STORM MAY INTENSIFY...SO BE CERTAIN TO MONITOR LOCAL RADIO AND
TV STATIONS...AS WELL AS LOCAL CABLE TV OUTLETS...FOR ADDITIONAL
INFORMATION AND POSSIBLE WARNINGS FROM THE NATIONAL WEATHER SERVICE.
&&
LAT...LON 3400 11175 3401 11143 3395 11137 3298 11153
3304 11264 3399 11272 3389 11228 3403 11215
3404 11204
TIME...MOT...LOC 0222Z 015DEG 17KT 3352 11197
\$\$
NOLTE

NWUS55 KPSR 300227
LSRPSR
PRELIMINARY LOCAL STORM REPORT
NATIONAL WEATHER SERVICE PHOENIX AZ
727 PM MST FRI JUL 29 2016
..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE....
..REMARKS..
0726 PM DUST STORM 1 S COOLIDGE 32.96N 111.52W
07/29/2016 PINAL AZ TRAINED SPOTTER
VISIBILITY 200 YARDS.
&&
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NWS PHOENIX AZ
IRIS SYSTEM

WWUS75 KPSR 300228
NPWPSR
URGENT - WEATHER MESSAGE
NATIONAL WEATHER SERVICE PHOENIX AZ
728 PM MST FRI JUL 29 2016
...DENSE BLOWING DUST POSSIBLE...
AZZ028-300400-
/O.UPG.KPSR.DU.Y.0025.000000T0000Z-160730T0400Z/
/O.NEW.KPSR.DS.W.0006.160730T0228Z-160730T0400Z/
NORTHWEST AND NORTH CENTRAL PINAL COUNTY-
INCLUDING THE CITIES OF...APACHE JUNCTION...CASA GRANDE...
COOLIDGE...FLORENCE
728 PM MST FRI JUL 29 2016
...DUST STORM WARNING IN EFFECT UNTIL 9 PM MST THIS EVENING...
THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A DUST STORM
WARNING...WHICH IS IN EFFECT UNTIL 9 PM MST THIS EVENING. THE
BLOWING DUST ADVISORY IS NO LONGER IN EFFECT.
* AFFECTED AREA...PINAL COUNTY INCLUDING COOLIDGE.
* TIMING...NOW THROUGH 9 PM.
* WINDS...GUSTS OVER 40 MPH LIKELY.
* VISIBILITY...SPOTTER REPORT THAT BLOWING DUST IS REDUCING VISIBILITIES

BELOW 1 QUARTER OF A MILE.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST
REDUCING VISIBILITY BELOW 1 QUARTER OF A MILE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY TO NEAR ZERO. IF YOU
ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT
APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR
VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR
FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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AZZ027-300400-

/O.CON.KPSR.DU.Y.0025.000000T0000Z-160730T0400Z/

SOUTHWEST MARICOPA COUNTY-
INCLUDING THE CITY OF...GILA BEND

728 PM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY REMAINS IN EFFECT UNTIL 9 PM MST THIS
EVENING...

* AFFECTED AREA...MUCH OF SOUTH-CENTRAL ARIZONA INCLUDING THE
INTERSTATE 8 CORRIDOR AND GILA BEND

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...BLOWING DUST IS PRODUCING VISIBILITIES BELOW 1
MILE. VISIBILITIES AS LOW ONE HALF OF A MILE ARE POSSIBLE.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING
DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING
DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER
BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT
APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR
VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR
FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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AZZ022-023-300400-

/O.CON.KPSR.DU.Y.0026.000000T0000Z-160730T0400Z/

NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-
INCLUDING THE CITIES OF...BUCKEYE...LAKE PLEASANT...MORRISTOWN...
NEW RIVER...TONOPAH...WICKENBURG...CAREFREE...CAVE CREEK...
CHANDLER...FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA...
PHOENIX...SCOTTSDALE...SUN CITY...TEMPE

728 PM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY REMAINS IN EFFECT UNTIL 9 PM MST THIS
EVENING...

* AFFECTED AREA...NORTHERN MARICOPA COUNTY.

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...BELOW 1 MILE WILL BE COMMON.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING
DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING
DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER
BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT

APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR
VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR
FOOT OFF THE BRAKE PEDAL.
REMEMBER...PULL ASIDE...STAY ALIVE.

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NWUS55 KPSR 300233

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

733 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0723 PM	NON-TSTM WND GST 7 NE DEER VALLEY	33.72N 112.02W	
07/29/2016	M51 MPH	MARICOPA	AZ MESONET
MESONET STATION 6 ENE DEER VALLEY /AT096/.			

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JS

NWUS55 KPSR 300238

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

738 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0733 PM	DUST STORM	1 NE ARIZONA CITY	32.76N 111.66W
07/29/2016		PINAL	AZ TRAINED SPOTTER
VSBY. 50 FT. IN DUST STORM.			

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JS

WWUS85 KPSR 300240

AWWPHX

AZZ023-300445-

AIRPORT WEATHER WARNING FOR SKY HARBOR AIRPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

740 PM MST FRI JUL 29 2016

...AIRPORT WEATHER WARNING FOR SKY HARBOR AIRPORT IN EFFECT UNTIL
945 PM MST...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED AN AIRPORT WEATHER
WARNING FOR SKY HARBOR AIRPORT FOR STRONG GUSTY WINDS...LIGHTNING
NEAR THE AIRFIELD AND BLOWING DUST.

WINDS WILL INCREASE TO AT LEAST 35 KNOTS. VISIBILITIES DROP TO
AROUND 1 MILE WILL BE POSSIBLE. LIGHTNING WILL CONTINUE IN THE
VICINITY AND OVER THE AIRPORT FOR THE NEXT 2 HOURS.

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WWUS75 KPSR 300243

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

743 PM MST FRI JUL 29 2016

AZZ023-300400-

/O.UPG.KPSR.DU.Y.0026.000000T0000Z-160730T0400Z/

/O.EXA.KPSR.DS.W.0006.000000T0000Z-160730T0400Z/

GREATER PHOENIX AREA-

INCLUDING THE CITIES OF...BUCKEYE...CAREFREE...CAVE CREEK...
CHANDLER...FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA...
PHOENIX...SCOTTSDALE...SUN CITY...TEMPE

743 PM MST FRI JUL 29 2016

...DUST STORM WARNING IN EFFECT UNTIL 9 PM MST THIS EVENING...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A DUST STORM
WARNING...WHICH IS IN EFFECT UNTIL 9 PM MST THIS EVENING. THE
BLOWING DUST ADVISORY IS NO LONGER IN EFFECT.

* AFFECTED AREA...THE PHOENIX AREA.

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...VISIBILITIES BELOW ONE QUARTER OF A MILE.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING
DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING
DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY TO NEAR ZERO. IF YOU
ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT
APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR
VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR
FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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AZZ028-300400-

/O.CON.KPSR.DS.W.0006.000000T0000Z-160730T0400Z/

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...APACHE JUNCTION...CASA GRANDE...

COOLIDGE...FLORENCE

743 PM MST FRI JUL 29 2016

...DUST STORM WARNING REMAINS IN EFFECT UNTIL 9 PM MST THIS
EVENING...

* AFFECTED AREA...PINAL COUNTY INCLUDING COOLIDGE.

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...SPOTTER REPORTS THAT BLOWING DUST IS REDUCING
VISIBILITIES BELOW ONE QUARTER OF A MILE.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING
DUST REDUCING VISIBILITY BELOW 1 QUARTER OF A MILE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY TO NEAR ZERO. IF YOU
ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT
APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR
VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR
FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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AZZ027-300400-

/O.CON.KPSR.DU.Y.0025.000000T0000Z-160730T0400Z/

SOUTHWEST MARICOPA COUNTY-

INCLUDING THE CITY OF...GILA BEND

743 PM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY REMAINS IN EFFECT UNTIL 9 PM MST THIS EVENING...

* AFFECTED AREA...MUCH OF SOUTH-CENTRAL ARIZONA INCLUDING THE INTERSTATE 8 CORRIDOR AND GILA BEND

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...BLOWING DUST IS PRODUCING VISIBILITIES BELOW 1 MILE. VISIBILITIES AS LOW ONE HALF OF A MILE ARE POSSIBLE.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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AZZ022-300400-

/O.CON.KPSR.DU.Y.0026.000000T0000Z-160730T0400Z/

NORTHWEST MARICOPA COUNTY-

INCLUDING THE CITIES OF...BUCKEYE...LAKE PLEASANT...MORRISTOWN... NEW RIVER...TONOPAH...WICKENBURG

743 PM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY REMAINS IN EFFECT UNTIL 9 PM MST THIS EVENING...

* AFFECTED AREA...NORTHERN MARICOPA COUNTY.

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...BELOW 1 MILE WILL BE COMMON.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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NWUS55 KPSR 300252

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

752 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
	..REMARKS..		

0745 PM	TSTM WND GST	1 NNE FLORENCE	33.04N 111.38W
07/29/2016	E45 MPH	PINAL	AZ TRAINED SPOTTER

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NWS PHOENIX AZ
IRIS SYSTEM

NWUS55 KPSR 300254
LSRPSR
PRELIMINARY LOCAL STORM REPORT
NATIONAL WEATHER SERVICE PHOENIX AZ
754 PM MST FRI JUL 29 2016
..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE....
..REMARKS..
0744 PM TSTM WND GST 1 WSW LUKE AFB 33.53N 112.38W
07/29/2016 M52 MPH MARICOPA AZ AWOS
AWOS STATION 1 WSW LUKE AFB /LUF/.

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JS

WWUS55 KPSR 300257
SVSPSR
SEVERE WEATHER STATEMENT
NATIONAL WEATHER SERVICE PHOENIX AZ
757 PM MST FRI JUL 29 2016
AZC013-300315-
/O.CON.KPSR.SV.W.0028.000000T0000Z-160730T0315Z/
MARICOPA AZ-
757 PM MST FRI JUL 29 2016
...A SEVERE THUNDERSTORM WARNING REMAINS IN EFFECT UNTIL 815 PM MST
FOR CENTRAL MARICOPA COUNTY...
AT 756 PM MST...DOPPLER RADAR INDICATED A SEVERE THUNDERSTORM CAPABLE
OF PRODUCING DAMAGING WINDS IN EXCESS OF 60 MPH. THIS STORM WAS
LOCATED OVER ARIZONA STATE UNIVERSITY...OR OVER TEMPE...MOVING
SOUTHWEST AT 30 MPH.
LOCATIONS IMPACTED INCLUDE...
PHOENIX...MESA...CHANDLER...SCOTTSDALE...TEMPE...PARADISE VALLEY...
SKY HARBOR AIRPORT...ARIZONA STATE UNIVERSITY...DOWNTOWN MESA...
FIESTA MALL...SOUTH PHOENIX...DOWNTOWN PHOENIX...
SALT RIVER INDIAN COMMUNITY...ARIZONA MILLS MALL...
CHANDLER FASHION CENTER MALL...MESA RIVERVIEW MALL...
TEMPE MARKETPLACE...CAMELBACK MOUNTAIN...
PAPAGO PARK AND DOWNTOWN SCOTTSDALE.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
IN ADDITION TO LARGE HAIL AND DAMAGING WINDS...CONTINUOUS CLOUD TO
GROUND LIGHTNING IS OCCURRING WITH THIS STORM. MOVE INDOORS
IMMEDIATELY. LIGHTNING IS ONE OF NATURE'S LEADING KILLERS.
REMEMBER... IF YOU CAN HEAR THUNDER...YOU ARE CLOSE ENOUGH TO BE
STRUCK BY LIGHTNING.

&&
LAT...LON 3361 11195 3352 11176 3327 11189 3339 11215
TIME...MOT...LOC 0256Z 027DEG 24KT 3343 11195
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NOLTE

NWUS55 KPSR 300257

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

757 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0744 PM	DUST STORM	4 NNE SANTAN	33.20N 111.77W
07/29/2016		PINAL	AZ TRAINED SPOTTER
0 VISIBILITY REPORTED.			

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NWS PHOENIX AZ

IRIS SYSTEM

NWUS55 KPSR 300301

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

801 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0800 PM	TSTM WND GST	4 E SUN LAKES	33.22N 111.80W
07/29/2016	M68 MPH	MARICOPA	AZ TRAINED SPOTTER

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NWS PHOENIX AZ

IRIS SYSTEM

NWUS55 KPSR 300302

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

802 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0741 PM	DUST STORM	2 SW BEARDSLEY	33.66N 112.41W
07/29/2016		MARICOPA	AZ TRAINED SPOTTER
VSBY. LESS THAN 1/8 MI. IN DUST STORM. .			

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JS

WWUS55 KPSR 300303

SVSPSR

SEVERE WEATHER STATEMENT

NATIONAL WEATHER SERVICE PHOENIX AZ

803 PM MST FRI JUL 29 2016

AZC013-021-300315-

/O.CON.KPSR.SV.W.0029.000000T0000Z-160730T0315Z/

MARICOPA AZ-PINAL AZ-

803 PM MST FRI JUL 29 2016

...A SEVERE THUNDERSTORM WARNING REMAINS IN EFFECT UNTIL 815 PM MST
FOR EASTERN MARICOPA AND NORTH CENTRAL PINAL COUNTIES...

AT 802 PM MST...DOPPLER RADAR INDICATED A SEVERE THUNDERSTORM CAPABLE
OF PRODUCING DAMAGING WINDS IN EXCESS OF 60 MPH. THIS STORM WAS
LOCATED NEAR EAST MESA...MOVING SOUTHWEST AT 30 MPH.
LOCATIONS IMPACTED INCLUDE...

MESA...GILBERT...APACHE JUNCTION...EAST MESA...QUEEN CREEK...
SALT RIVER TUBING RECREATION AREA...FREESTONE PARK...
USERY MOUNTAIN PARK...SUPERSTITION SPRINGS MALL...CANYON LAKE...
GOLDFIELD RANCH...LOST DUTCHMAN STATE PARK...FALCON FIELD AIRPORT...
SAGUARO LAKE...PHOENIX MESA GATEWAY AIRPORT...GRANITE REEF DAM...
GILBERT CITY HALL...GOLD CAMP AND HIGLEY.
PRECAUTIONARY/PREPAREDNESS ACTIONS...

PERIODS OF HEAVY RAINFALL ARE POSSIBLE WITH STORMS THIS EVENING.
AREA ROADS MAY FLOOD QUICKLY...SO DO NOT DRIVE INTO AREAS WHERE
WATER COVERS THE ROAD.

TO REPORT SEVERE WEATHER...CONTACT YOUR NEAREST LAW ENFORCEMENT
AGENCY. THEY WILL RELAY YOUR REPORT TO THE NATIONAL WEATHER SERVICE
OFFICE IN PHOENIX.

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LAT...LON 3363 11161 3355 11140 3322 11154 3335 11183

TIME...MOT...LOC 0302Z 028DEG 25KT 3340 11163

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NOLTE

NWUS55 KPSR 300303

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

803 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	...MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0750 PM	DUST STORM	2 ENE CASA GRANDE	32.89N 111.72W
07/29/2016		PINAL	AZ TRAINED SPOTTER
50 FT VISIBILITY.			

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NWS PHOENIX AZ

IRIS SYSTEM

NWUS55 KPSR 300311

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

811 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	...MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0755 PM	TSTM WND GST	5 NNW CASA GRANDE	32.95N 111.77W
07/29/2016	M61 MPH	PINAL	AZ AWOS
AWOS STATION CASA GRANDE MUNICIPAL AIRPORT			
/CGZ/.			

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JS

NWUS55 KPSR 300315

LSRPSR

PRELIMINARY LOCAL STORM REPORT
NATIONAL WEATHER SERVICE PHOENIX AZ
815 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
	..REMARKS..		
0802 PM	HAIL	3 SSE TEMPE	33.35N 111.90W
07/29/2016	U0.50 INCH	MARICOPA	AZ TRAINED SPOTTER

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JS

WWUS75 KPSR 300319

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

819 PM MST FRI JUL 29 2016

AZZ027-300430-

/O.UPG.KPSR.DU.Y.0025.000000T0000Z-160730T0400Z/

/O.EXA.KPSR.DS.W.0006.000000T0000Z-160730T0400Z/

SOUTHWEST MARICOPA COUNTY-

INCLUDING THE CITY OF...GILA BEND

819 PM MST FRI JUL 29 2016

...DUST STORM WARNING IN EFFECT UNTIL 9 PM MST THIS EVENING...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A DUST STORM WARNING...WHICH IS IN EFFECT UNTIL 9 PM MST THIS EVENING. THE BLOWING DUST ADVISORY IS NO LONGER IN EFFECT.

* AFFECTED AREA...SOUTHWESTERN MARICOPA COUNTY INCLUDING GILA BEND

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...VISIBILITIES ARE EXPECTED TO DROP DOWN TO A QUARTER OF A MILE.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST REDUCING VISIBILITY BELOW ONE QUARTER OF A MILE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY TO NEAR ZERO. IF YOU ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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AZZ022-300430-

/O.UPG.KPSR.DU.Y.0026.000000T0000Z-160730T0400Z/

/O.EXA.KPSR.DS.W.0006.000000T0000Z-160730T0400Z/

NORTHWEST MARICOPA COUNTY-

INCLUDING THE CITIES OF...BUCKEYE...LAKE PLEASANT...MORRISTOWN...

NEW RIVER...TONOPAH...WICKENBURG

819 PM MST FRI JUL 29 2016

...DUST STORM WARNING IN EFFECT UNTIL 9 PM MST THIS EVENING...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A DUST STORM WARNING...WHICH IS IN EFFECT UNTIL 9 PM MST THIS EVENING. THE BLOWING DUST ADVISORY IS NO LONGER IN EFFECT.

* AFFECTED AREA...NORTHWESTERN MARICOPA COUNTY INCLUDING WICKENBURG.

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.
* VISIBILITY...VISIBILITIES ARE EXPECTED TO DROP DOWN TO A QUARTER OF A MILE.
* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST REDUCING VISIBILITY BELOW ONE QUARTER OF A MILE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY TO NEAR ZERO. IF YOU ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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AZZ023-028-300430-

/O.CON.KPSR.DS.W.0006.000000T0000Z-160730T0400Z/

GREATER PHOENIX AREA-NORTHWEST AND NORTH CENTRAL PINAL COUNTY- INCLUDING THE CITIES OF...BUCKEYE...CAREFREE...CAVE CREEK... CHANDLER...FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA... PHOENIX...SCOTTSDALE...SUN CITY...TEMPE...APACHE JUNCTION... CASA GRANDE...COOLIDGE...FLORENCE

819 PM MST FRI JUL 29 2016

...DUST STORM WARNING REMAINS IN EFFECT UNTIL 9 PM MST THIS EVENING...

* AFFECTED AREA...THE PHOENIX AREA.

* TIMING...NOW THROUGH 9 PM.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...VISIBILITIES BELOW ONE A QUARTER OF A MILE WILL PERSIST.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST REDUCING VISIBILITY BELOW ONE QUARTER OF A MILE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY TO NEAR ZERO. IF YOU ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

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NWUS55 KPSR 300340

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

840 PM MST FRI JUL 29 2016

..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...

..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE....

..REMARKS..

0835 PM DUST STORM 8 SSW AK-CHIN VILLAGE 32.93N 112.16W

07/29/2016 PINAL AZ TRAINED SPOTTER

VISIBILITY 0.

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NWS PHOENIX AZ

IRIS SYSTEM

WWUS55 KPSR 300341
SVSPSR
SEVERE WEATHER STATEMENT
NATIONAL WEATHER SERVICE PHOENIX AZ
841 PM MST FRI JUL 29 2016
AZC021-300400-
/O.CON.KPSR.SV.W.0032.000000T0000Z-160730T0400Z/
PINAL AZ-
841 PM MST FRI JUL 29 2016
...A SEVERE THUNDERSTORM WARNING REMAINS IN EFFECT UNTIL 900 PM MST
FOR NORTHEASTERN PINAL COUNTY...
AT 840 PM MST...DOPPLER RADAR INDICATED A SEVERE THUNDERSTORM CAPABLE
OF PRODUCING DAMAGING WINDS IN EXCESS OF 60 MPH. THIS STORM WAS
LOCATED OVER QUEEN VALLEY...OR 11 MILES WEST OF SUPERIOR...MOVING
SOUTHEAST AT 20 MPH. PENNY SIZE HAIL AND PERIODIC HEAVY RAINFALL MAY
ALSO ACCOMPANY THE DAMAGING WINDS.
LOCATIONS IMPACTED INCLUDE...
APACHE JUNCTION...SUPERIOR...QUEEN VALLEY...GOLD CAMP...
BOYCE THOMPSON ARBORETUM...FLORENCE JUNCTION AND KINGS RANCH.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
SEVERE THUNDERSTORMS PRODUCE DAMAGING WINDS...DESTRUCTIVE
HAIL...DEADLY LIGHTNING AND VERY HEAVY RAIN. FOR YOUR PROTECTION
MOVE TO AN INTERIOR ROOM ON THE LOWEST FLOOR OF YOUR HOME OR
BUSINESS. HEAVY RAINS FLOOD ROADS QUICKLY SO DO NOT DRIVE INTO AREAS
WHERE WATER COVERS THE ROAD.
&&
LAT...LON 3338 11150 3345 11130 3327 11102 3307 11137
TIME...MOT...LOC 0340Z 323DEG 19KT 3328 11131
\$\$
NOLTE

WWUS75 KPSR 300341
NPWPSR
URGENT - WEATHER MESSAGE
NATIONAL WEATHER SERVICE PHOENIX AZ
841 PM MST FRI JUL 29 2016
AZZ022-023-027-028-300445-
/O.CAN.KPSR.DS.W.0006.000000T0000Z-160730T0400Z/
NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-
SOUTHWEST MARICOPA COUNTY-
NORTHWEST AND NORTH CENTRAL PINAL COUNTY-
INCLUDING THE CITIES OF...BUCKEYE...LAKE PLEASANT...MORRISTOWN...
NEW RIVER...TONOPAH...WICKENBURG...CAREFREE...CAVE CREEK...
CHANDLER...FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA...
PHOENIX...SCOTTSDALE...SUN CITY...TEMPE...GILA BEND...
APACHE JUNCTION...CASA GRANDE...COOLIDGE...FLORENCE
841 PM MST FRI JUL 29 2016
...DUST STORM WARNING IS CANCELLED...
THE NATIONAL WEATHER SERVICE IN PHOENIX HAS CANCELLED THE DUST
STORM WARNING.
VISIBILITIES HAVE IMPROVED ACROSS MARICOPA AND PINAL COUNTIES.
HOWEVER...STRONG STORMS PERSIST ACROSS THE AREA...WHICH WILL PRODUCE
LOCALIZED AREAS OF BLOWING DUST AND REDUCED VISIBILITIES.
\$\$
AZZ026-300500-
/O.CON.KPSR.DU.Y.0026.000000T0000Z-160730T0500Z/
SOUTHWEST DESERTS-

INCLUDING THE CITIES OF...DATELAND...TACNA...WELLTON

841 PM MST FRI JUL 29 2016

...BLOWING DUST ADVISORY REMAINS IN EFFECT UNTIL 10 PM MST THIS EVENING...

* AFFECTED AREA...PORTIONS OF YUMA COUNTY.

* TIMING...LATER THIS EVENING.

* WINDS...GUSTS OVER 40 MPH LIKELY.

* VISIBILITY...BELOW 1 MILE WILL BE COMMON.

* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST REDUCING VISIBILITY BELOW 1 MILE. LOCAL DENSE BLOWING DUST IS ALSO POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

BE READY FOR A SUDDEN DROP IN VISIBILITY. IF YOU ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.

REMEMBER...PULL ASIDE...STAY ALIVE.

&&

\$\$

WWUS55 KPSR 300343

SVSPSR

SEVERE WEATHER STATEMENT

NATIONAL WEATHER SERVICE PHOENIX AZ

843 PM MST FRI JUL 29 2016

AZC013-300400-

/O.CON.KPSR.SV.W.0031.000000T0000Z-160730T0400Z/

MARICOPA AZ-

843 PM MST FRI JUL 29 2016

...A SEVERE THUNDERSTORM WARNING REMAINS IN EFFECT UNTIL 900 PM MST FOR WEST CENTRAL MARICOPA COUNTY...

AT 842 PM MST...DOPPLER RADAR INDICATED A SEVERE THUNDERSTORM CAPABLE OF PRODUCING DESTRUCTIVE WINDS IN EXCESS OF 70 MPH. THIS STORM WAS LOCATED OVER BUCKEYE...MOVING SOUTHWEST AT 10 MPH. NICKEL SIZE HAIL AND HEAVY RAINFALL WILL ALSO ACCOMPANY THE DAMAGING WINDS. LOCATIONS IMPACTED INCLUDE...

GOODYEAR...BUCKEYE...LIBERTY...WHITE TANK MOUNTAIN PARK...PALO VERDE NUCLEAR GENERATION STATION...PERRYVILLE...WINTERSBURG...ESTRELLA MOUNTAIN RANCH...PALO VERDE...HASSAYAMPA AND ARLINGTON.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

IF YOU ARE IN THE PATH OF THIS STORM...PREPARE IMMEDIATELY FOR LARGE HAIL AND DAMAGING WINDS. PEOPLE OUTSIDE SHOULD MOVE TO A SHELTER...PREFERABLY INSIDE A STRONG BUILDING AND AWAY FROM WINDOWS. TORRENTIAL RAINFALL IS ALSO OCCURRING WITH THIS STORM...AND MAY LEAD TO FLASH FLOODING. DO NOT DRIVE YOUR VEHICLE THROUGH FLOODED ROADWAYS.

&&

LAT...LON 3366 11283 3355 11243 3322 11242 3334 11301

TIME...MOT...LOC 0342Z 025DEG 8KT 3339 11263

\$\$

NOLTE

WWUS55 KPSR 300346

SVSPSR

SEVERE WEATHER STATEMENT

NATIONAL WEATHER SERVICE PHOENIX AZ

846 PM MST FRI JUL 29 2016
AZC013-021-300400-
/O.CON.KPSR.SV.W.0033.000000T0000Z-160730T0400Z/
MARICOPA AZ-PINAL AZ-

846 PM MST FRI JUL 29 2016
...A SEVERE THUNDERSTORM WARNING REMAINS IN EFFECT UNTIL 900 PM MST
FOR CENTRAL MARICOPA AND NORTHWESTERN PINAL COUNTIES...
AT 846 PM MST...DOPPLER RADAR INDICATED A SEVERE THUNDERSTORM
CAPABLE OF PRODUCING DAMAGING WINDS IN EXCESS OF 60 MPH. THIS STORM
WAS LOCATED 9 MILES SOUTH OF ESTRELLA MOUNTAIN PARK...OR 15 MILES
SOUTH OF AVONDALE...MOVING SOUTHWEST AT 40 MPH. PENNY SIZE HAIL
AND HEAVY RAINFALL MAY ALSO ACCOMPANY THE DAMAGING WINDS.
LOCATIONS IMPACTED INCLUDE...
PHOENIX...CHANDLER...TEMPE...AVONDALE...GOODYEAR...TOLLESON...
LAVEEN...SKY HARBOR AIRPORT...ARIZONA STATE UNIVERSITY...
SOUTH MOUNTAIN PARK...SOUTH PHOENIX...DOWNTOWN PHOENIX...
SALT RIVER INDIAN COMMUNITY...ARIZONA MILLS MALL...
ARIZONA STATE FAIRGROUNDS...TEMPE MARKETPLACE...PAPAGO PARK...
GUADALUPE...RAINBOW VALLEY AND KOMATKE.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
SEVERE THUNDERSTORMS PRODUCE DAMAGING WINDS...DESTRUCTIVE
HAIL...DEADLY LIGHTNING AND VERY HEAVY RAIN. FOR YOUR PROTECTION
MOVE TO AN INTERIOR ROOM ON THE LOWEST FLOOR OF YOUR HOME OR
BUSINESS. HEAVY RAINS FLOOD ROADS QUICKLY SO DO NOT DRIVE INTO AREAS
WHERE WATER COVERS THE ROAD.
TORRENTIAL RAINFALL IS ALSO OCCURRING WITH THIS STORM...AND MAY LEAD
TO FLASH FLOODING. DO NOT DRIVE YOUR VEHICLE THROUGH FLOODED
ROADWAYS.

&&
LAT...LON 3347 11221 3349 11186 3314 11195 3322 11243
TIME...MOT...LOC 0346Z 049DEG 35KT 3320 11233
\$\$
NOLTE

WWUS55 KPSR 300353
SVSPSR
SEVERE WEATHER STATEMENT
NATIONAL WEATHER SERVICE PHOENIX AZ
853 PM MST FRI JUL 29 2016
AZC021-300402-
/O.EXP.KPSR.SV.W.0032.000000T0000Z-160730T0400Z/
PINAL AZ-

853 PM MST FRI JUL 29 2016
...THE SEVERE THUNDERSTORM WARNING FOR NORTHEASTERN PINAL COUNTY WILL
EXPIRE AT 900 PM MST...
THE STORM WHICH PROMPTED THE WARNING HAS WEAKENED BELOW SEVERE
LIMITS...AND NO LONGER POSES AN IMMEDIATE THREAT TO LIFE OR PROPERTY.
THEREFORE THE WARNING WILL BE ALLOWED TO EXPIRE. HOWEVER GUSTY WINDS
AND HEAVY RAIN ARE STILL POSSIBLE WITH THIS THUNDERSTORM.
LAT...LON 3338 11150 3345 11130 3327 11102 3307 11137
TIME...MOT...LOC 0345Z 323DEG 19KT 3328 11131
\$\$
NOLTE

NWUS55 KPSR 300353
LSRPSR
PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

853 PM MST FRI JUL 29 2016

..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE....
..REMARKS..
0851 PM TSTM WND GST 2 E PHOENIX 33.45N 112.05W
07/29/2016 E40 MPH MARICOPA AZ TRAINED SPOTTER
3 IN DIAMETER TREE BLOWN OVER .

&&

\$\$

NWS PHOENIX AZ

IRIS SYSTEM

WWUS55 KPSR 300357

SVSPSR

SEVERE WEATHER STATEMENT

NATIONAL WEATHER SERVICE PHOENIX AZ

857 PM MST FRI JUL 29 2016

AZC013-021-300407-

/O.EXP.KPSR.SV.W.0033.000000T0000Z-160730T0400Z/

MARICOPA AZ-PINAL AZ-

857 PM MST FRI JUL 29 2016

...THE SEVERE THUNDERSTORM WARNING FOR CENTRAL MARICOPA AND
NORTHWESTERN PINAL COUNTIES WILL EXPIRE AT 900 PM MST...
THE STORM WHICH PROMPTED THE WARNING HAS MOVED OUT OF THE AREA.
THEREFORE THE WARNING WILL BE ALLOWED TO EXPIRE. HOWEVER HEAVY RAIN
IS STILL POSSIBLE WITH THIS THUNDERSTORM.
TO REPORT SEVERE WEATHER...CONTACT YOUR NEAREST LAW ENFORCEMENT
AGENCY. THEY WILL RELAY YOUR REPORT TO THE NATIONAL WEATHER SERVICE
PHOENIX.

LAT...LON 3347 11221 3349 11186 3314 11195 3322 11243

TIME...MOT...LOC 0350Z 049DEG 35KT 3320 11233

\$\$

NOLTE

NWUS55 KPSR 300402

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

902 PM MST FRI JUL 29 2016

..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE....
..REMARKS..
0901 PM TSTM WND DMG 4 N PHOENIX 33.51N 112.07W
07/29/2016 MARICOPA AZ TRAINED SPOTTER
2 FT DIAMETER TREE UPROOTED.

&&

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NWS PHOENIX AZ

IRIS SYSTEM

NWUS55 KPSR 300405

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

905 PM MST FRI JUL 29 2016

..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...

..DATE... ..MAG.... ..COUNTY LOCATION..ST... ..SOURCE....
..REMARKS..
0815 PM TSTM WND GST 1 SE SKY HARBOR AIRPORT 33.43N 112.00W
07/29/2016 M70 MPH MARICOPA AZ ASOS
ASOS STATION PHOENIX SKY HARBOR INTL ARPT
/PHX/.

&&
\$\$
JS

NWUS55 KPSR 300408

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

908 PM MST FRI JUL 29 2016

..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST... ..SOURCE....
..REMARKS..
0815 PM TSTM WND GST 5 WSW PHOENIX 33.42N 112.15W
07/29/2016 M68 MPH MARICOPA AZ MESONET
MESONET STATION 4 WSW PHOENIX /SRP32/.

&&
\$\$
JS

NWUS55 KPSR 300409

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

909 PM MST FRI JUL 29 2016

..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST... ..SOURCE....
..REMARKS..
0903 PM TSTM WND DMG 2 E PARADISE VALLEY 33.52N 111.90W
07/29/2016 MARICOPA AZ TRAINED SPOTTER
3 TREES BLOWN DOWN, 6 IN DIAMETER.

&&
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NWS PHOENIX AZ
IRIS SYSTEM

NWUS55 KPSR 300410

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

910 PM MST FRI JUL 29 2016

..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST... ..SOURCE....
..REMARKS..
0855 PM TSTM WND GST 6 WNW BUCKEYE 33.42N 112.69W
07/29/2016 M62 MPH MARICOPA AZ AWOS
AWOS STATION 6 WNW BUCKEYE /BXK/.

&&
\$\$
JS

NWUS55 KPSR 300411

LSRPSR
PRELIMINARY LOCAL STORM REPORT
NATIONAL WEATHER SERVICE PHOENIX AZ
911 PM MST FRI JUL 29 2016
..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST... ..SOURCE....
..REMARKS..
0810 PM TSTM WND GST 5 SE MARICOPA 33.02N 111.99W
07/29/2016 M63 MPH PINAL AZ MESONET
MESONET STATION 4 SE MARICOPA /UP559/.
&&
\$\$
JS

WWUS85 KPSR 300420
SPSPSR
SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE PHOENIX AZ
920 PM MST FRI JUL 29 2016
AZZ021>023-300500-
GREATER PHOENIX AREA AZ-NORTHWEST MARICOPA COUNTY AZ-
WEST CENTRAL DESERTS AZ-
920 PM MST FRI JUL 29 2016
...SIGNIFICANT WEATHER ADVISORY...
THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A
SIGNIFICANT WEATHER ADVISORY FOR...
NORTHWESTERN MARICOPA AND EAST CENTRAL LA PAZ COUNTIES
UNTIL 1000 PM MST
AT 919 PM MST...DOPPLER RADAR WAS TRACKING AN AREA OF STRONG
THUNDERSTORM WINDS AND DEVELOPING STRONG THUNDERSTORMS NEAR
MORRISTOWN...OR 7 MILES NORTHWEST OF CIRCLE CITY...MOVING NORTHWEST
AT 45 MPH.
WIND GUSTS OF 50 TO 55 MPH...SOME AREAS OF BLOWING DUST AND
HEAVY RAINFALL WILL BE POSSIBLE WITH THESE STORMS.
LOCATIONS IMPACTED INCLUDE...
SURPRISE...WICKENBURG...WITTMANN...CIRCLE CITY...SUN CITY WEST...
AGUILA...WENDEN...WHITE TANK MOUNTAIN PARK...GLADDEN...MORRISTOWN...
BEARDSLEY AND VISTANCIA.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
LOCALLY DENSE BLOWING DUST IS POSSIBLE. IF YOU ENCOUNTER BLOWING
DUST WHILE DRIVING...PULL OVER AS FAR OFF THE ROADWAY AS POSSIBLE AND
PARK. TURN OFF YOUR HEADLIGHTS AND KEEP YOUR FOOT OFF THE BRAKE.
THESE STORMS MAY INTENSIFY...SO BE CERTAIN TO MONITOR LOCAL RADIO
AND TV STATIONS...AS WELL AS LOCAL CABLE TV OUTLETS...FOR ADDITIONAL
INFORMATION AND POSSIBLE WARNINGS FROM THE NATIONAL WEATHER SERVICE.
&&
A SEVERE THUNDERSTORM WATCH REMAINS IN EFFECT UNTIL 1100 PM MST FOR
SOUTH CENTRAL ARIZONA.
LAT...LON 3400 11333 3400 11274 3389 11231 3391 11224
3394 11223 3391 11213 3352 11252 3383 11361
3419 11334
TIME...MOT...LOC 0419Z 116DEG 38KT 3386 11270
\$\$
NOLTE

NWUS55 KPSR 300424
LSRPSR

PRELIMINARY LOCAL STORM REPORT
NATIONAL WEATHER SERVICE PHOENIX AZ
924 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0921 PM	DUST STORM	GILA BEND	32.95N 112.71W
07/29/2016		MARICOPA	AZ PUBLIC
LESS THAN 1/4 MILE VISIBILITY.			

&&
\$\$
INIGUEZ

WWUS85 KPSR 300425

SPSPSR

SPECIAL WEATHER STATEMENT

NATIONAL WEATHER SERVICE PHOENIX AZ

925 PM MST FRI JUL 29 2016

AZZ027-028-300515-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY AZ-

SOUTHWEST MARICOPA COUNTY AZ-

925 PM MST FRI JUL 29 2016

...SIGNIFICANT WEATHER ADVISORY...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A
SIGNIFICANT WEATHER ADVISORY FOR...

SOUTH CENTRAL MARICOPA AND SOUTHWESTERN PINAL COUNTIES

UNTIL 1015 PM MST

AT 924 PM MST...DOPPLER RADAR WAS TRACKING AN AREA OF STRONG
THUNDERSTORMS 7 MILES SOUTHWEST OF MARICOPA...OR 22 MILES WEST OF
CASA GRANDE...MOVING SOUTH AT 20 MPH.

WIND GUSTS OF 50 TO 55 MPH...PATCHY BLOWING DUST AND RESULTING
REDUCED VISIBILITIES...AND BRIEF HEAVY RAINFALL WILL BE POSSIBLE
WITH THESE STORMS.

LOCATIONS IMPACTED INCLUDE...

CASA GRANDE...MARICOPA...FREEMAN...OLBERG...ESTRELLA SAILPORT...

KAKA...MOBILE...AK-CHIN VILLAGE AND STANFIELD.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

LOCALLY DENSE BLOWING DUST IS POSSIBLE. IF YOU ENCOUNTER BLOWING
DUST WHILE DRIVING...PULL OVER AS FAR OFF THE ROADWAY AS POSSIBLE AND
PARK. TURN OFF YOUR HEADLIGHTS AND KEEP YOUR FOOT OFF THE BRAKE.

&&

A SEVERE THUNDERSTORM WATCH REMAINS IN EFFECT UNTIL 1100 PM MST FOR
SOUTH CENTRAL AND SOUTHEASTERN ARIZONA.

LAT...LON 3253 11252 3320 11221 3308 11176 3279 11185

3277 11189 3276 11205 3272 11207 3272 11214

3268 11215 3268 11220 3250 11221

TIME...MOT...LOC 0424Z 020DEG 18KT 3296 11211

\$\$

NOLTE

WWUS75 KPSR 300432

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

932 PM MST FRI JUL 29 2016

AZZ027-300600-

/O.NEW.KPSR.DS.W.0007.160730T0432Z-160730T0600Z/

SOUTHWEST MARICOPA COUNTY-
INCLUDING THE CITY OF...GILA BEND
932 PM MST FRI JUL 29 2016
...DUST STORM WARNING IN EFFECT UNTIL 11 PM MST THIS EVENING...
THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A DUST STORM
WARNING...WHICH IS IN EFFECT UNTIL 11 PM MST THIS EVENING.
* AFFECTED AREA...SOUTHWESTERN MARICOPA COUNTY INCLUDING GILA BEND.
* TIMING...THROUGH 11 PM.
* WINDS...AS HIGH AS 50 MPH.
* VISIBILITY...AS LOW AS ONE QUARTER OF A MILE.
* IMPACTS...HAZARDOUS DRIVING CONDITIONS FROM WIDESPREAD BLOWING DUST
REDUCING VISIBILITY BELOW ONE QUARTER OF A MILE.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
BE READY FOR A SUDDEN DROP IN VISIBILITY TO NEAR ZERO. IF YOU
ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT
APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR
VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR
FOOT OFF THE BRAKE PEDAL.
REMEMBER...PULL ASIDE...STAY ALIVE.
&&
\$\$

NWUS55 KPSR 300436
LSRPSR
PRELIMINARY LOCAL STORM REPORT
NATIONAL WEATHER SERVICE PHOENIX AZ
936 PM MST FRI JUL 29 2016
..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...
..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE....
..REMARKS..
0840 PM TSTM WND DMG 5 NNE BUCKEYE 33.44N 112.56W
07/29/2016 MARICOPA AZ TRAINED SPOTTER
A FEW PALO VERDE TREES DOWN AND CURB TO CURB
FLOODING. TIME ESTIMATED BASED ON RADAR.
YUMA ROAD AND WATSON RD.
&&
\$\$
INIGUEZ

WWUS55 KPSR 300439
SVSPSR
SEVERE WEATHER STATEMENT
NATIONAL WEATHER SERVICE PHOENIX AZ
939 PM MST FRI JUL 29 2016
AZC013-300449-
/O.EXP.KPSR.SV.W.0034.000000T0000Z-160730T0445Z/
MARICOPA AZ-
939 PM MST FRI JUL 29 2016
...THE SEVERE THUNDERSTORM WARNING FOR WEST CENTRAL MARICOPA COUNTY
WILL EXPIRE AT 945 PM MST...
THE STORM WHICH PROMPTED THE WARNING HAS MOVED OUT OF THE AREA.
THEREFORE THE WARNING WILL BE ALLOWED TO EXPIRE.
LAT...LON 3357 11283 3351 11243 3320 11249 3331 11302
TIME...MOT...LOC 0433Z 064DEG 8KT 3342 11269
\$\$
NOLTE

NWUS55 KPSR 300445

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

945 PM MST FRI JUL 29 2016

..TIME... ..EVENT... ..CITY LOCATION... ..LAT.LON...

..DATE... ..MAG.... ..COUNTY LOCATION..ST.. ..SOURCE....

..REMARKS..

0905 PM DUST STORM WITTMANN 33.78N 112.52W

07/29/2016 MARICOPA AZ TRAINED SPOTTER

BLOWING DUST REDUCED VISIBILITY TO 600 FEET.

&&

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AD

WWUS55 KPSR 300448

SVSPSR

SEVERE WEATHER STATEMENT

NATIONAL WEATHER SERVICE PHOENIX AZ

948 PM MST FRI JUL 29 2016

AZC013-300500-

/O.CON.KPSR.SV.W.0035.000000T0000Z-160730T0500Z/

MARICOPA AZ-

948 PM MST FRI JUL 29 2016

...A SEVERE THUNDERSTORM WARNING REMAINS IN EFFECT UNTIL 1000 PM MST
FOR SOUTHWESTERN MARICOPA COUNTY...

AT 947 PM MST...DOPPLER RADAR INDICATED A SEVERE THUNDERSTORM CAPABLE
OF PRODUCING QUARTER SIZE HAIL AND DESTRUCTIVE WINDS IN EXCESS OF 80
MPH. THIS STORM WAS LOCATED 9 MILES SOUTHEAST OF GILA BEND AUXILIARY
FIELD...OR 12 MILES SOUTH OF GILA BEND...MOVING SOUTHWEST AT 30 MPH.
THE GILA BEND AUXILIARY FIELD MEASURED A WIND GUSTS IN EXCESS OF 85
MPH.

LOCATIONS IMPACTED INCLUDE...

BUCKEYE...GILA BEND...ESTRELLA...BIG HORN...

GILA BEND AUXILIARY FIELD...COTTON CENTER...

BOSQUE AND SONORAN NATIONAL MONUMENT.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

MOBILE HOMES AND HIGH PROFILE VEHICLES ARE ESPECIALLY SUSCEPTIBLE TO
WINDS OF THIS MAGNITUDE AND MAY BE OVERTURNED. FOR YOUR PROTECTION
MOVE IMMEDIATELY TO A SAFE SHELTER OR TO AN INTERIOR ROOM ON THE
LOWEST FLOOR OF YOUR HOME OR BUSINESS. THIS STORM HAS THE POTENTIAL
TO CAUSE SERIOUS INJURY AND SIGNIFICANT PROPERTY DAMAGE.

TORRENTIAL RAINFALL IS ALSO OCCURRING WITH THIS STORM...AND MAY LEAD
TO FLASH FLOODING. DO NOT DRIVE YOUR VEHICLE THROUGH FLOODED
ROADWAYS.

&&

LAT...LON 3325 11265 3308 11227 3256 11251 3286 11306

TIME...MOT...LOC 0447Z 027DEG 27KT 3277 11265

\$\$

NOLTE

FXUS65 KPSR 300450

AFDPSR

Area Forecast Discussion

National Weather Service Phoenix AZ

950 PM MST FRI JUL 29 2016

.SYNOPSIS...

A much more humid airmass will move into the Desert Southwest this weekend, causing a modest drop in temperatures. There will be a marked increase in thunderstorm activity continuing into next week. All typical hazards associated with the monsoon season including strong damaging winds, blowing dust, lightning, and localized flooding will be in play.

&&

.DISCUSSION...

Strong to severe storms materialized over much of south-central Arizona this evening in a near-classic monsoon setup. Strong low-level convergence between two main outflow boundaries generated rapidly-forming cells across the Phoenix area. Some damage has been reported along with widespread winds generally in a 40 to 55 mph range and areas of blowing dust. Wind gusts reached 70 mph at Sky Harbor Airport and KIWA radar indicated winds as high as 90 mph just above the surface in the West Valley. Fast-moving nature of the storms has limited the flooding potential, however there have been some isolated reports of rainfall around an inch, particularly across portions of Scottsdale.

Latest runs of the HRRR indicate that storms will continue to decrease in coverage as the main MCS migrates westward further into the lower deserts of western Arizona. However, any storms that form still have the potential to produce strong to severe winds and heavy rain.

&&

.PREVIOUS DISCUSSION...

Activity Saturday may become highly dependent on evolution of outflow and convection tonight; and much of the forecast model output indicates very delayed build up of instability Saturday afternoon. In fact, forecast soundings show the typical convectively overturned environment during the morning, then a subsident capping inversion/elevated mixed layer developing near 700mb during the afternoon. Ensemble mean probabilities and high resolution output correspondingly are rather muted in convective response into the early evening, though show a far more robust response into the late evening overnight. A vast majority of model output still latches onto a well defined inverted trough/shortwave Saturday night while at the same time surges an anomalously high theta-e airmass northward towards central Arizona. POPs remain quite high during the Sunday morning time frame with the potential for locally heavy rain. Consequently, residual cloud cover through the daylight hours Sunday may very well keep temperatures over central Arizona well retarded while shifting convective activity westward.

Monday through Thursday...

1000-700 mb mean mixing ratios remain in the 10-12 g/kg through at least Tuesday, keeping above-climo rain chances in the forecast. GFS trends toward a slow decline of moisture beginning Wednesday and especially Thursday (GEM starts drying on Monday). This is reflected in a gradual eastward retreat PoPs from NAEFS and ESRL output. ECMWF however holds on to moisture longer as it stalls out an inverted trough over Arizona. Thus held on to PoPs over south-central AZ through Thursday. Temperatures during the week will trend slowly upward.

&&

.AVIATION...

South-Central Arizona Including KPHX, KIWA, and KSDL:

Westerly winds to prevail through the late afternoon hours with stronger winds (sustained speeds as high as 12 kts) during the mid-late afternoon hours today.

Latest high-res computer models are now in much better agreement on the idea that thunderstorms developing over the higher terrain east of Phoenix, at least sending strong outflow winds this evening into the Greater Phoenix Area during the 01Z-02Z hours. This will likely affecting all of the Phx area taf sites with even a decent chance for the storms themselves affecting one or more of the taf sites. Wind speeds of at least 25 kts, with gusts as high as 35 kts look likely, with even stronger speeds possible along with blowing dust reducing visibilities. Heavy downpours and even small hail are possible if thunderstorms do actually reach the terminal(s). Winds will become light easterly later this evening, once the storms move through. Southeast California/Southwest Arizona including KIPL and KBLH: Should be another quiet taf period at KIPL, with little chance of any isolated showers or storms, and winds remaining from a southeasterly direction.

Winds will continue to favor southerly directions and wind speeds at KBLH through this evening, with stronger winds during the late afternoon/evening hours. There is fairly high confidence that outflows from thunderstorms over South-Central AZ will affect KBLH for a time later this evening, with winds becoming gusty from an easterly direction along with some blowing dust possible.

Aviation Discussion not updated for amended TAFs.

&&

.FIRE WEATHER...

Monday through Friday...

Deep southerly to southeasterly flow aloft is expected to push copious amounts of monsoon moisture into the region, resulting in scattered to numerous thunderstorms Monday through Wednesday with good to excellent chances for at least some wetting rains and locally gusty winds. The combination of considerable cloudiness and rainfall will also keep temperatures below normal during this period, and humidities above normal. A shift to more westerly winds aloft is then expected to gradually reduce moisture levels, and chances for wetting rains during the Thursday-Friday period, while allowing temperatures to return to near-normal levels. Minimum humidities in the 25-45 percent range in the Monday-Wednesday period to drop into the 20-35 percent range by Friday, with good-excellent overnight recoveries. Outside of thunderstorms, winds to mainly follow typical diurnal trends.

&&

.SPOTTER INFORMATION STATEMENT...

Spotter activation is possible this evening and Saturday.

&&

.PSR WATCHES/WARNINGS/ADVISORIES...

AZ...Blowing Dust Advisory until 10 PM MST this evening for AZZ026.

CA...None.

&&

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DISCUSSION...HIRSCH

PREVIOUS DISCUSSION...MO/AJ

AVIATION...Percha

FIRE WEATHER...Percha

NWUS55 KPSR 300450

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

950 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0943 PM	TSTM WND GST	4 S GILA BEND	32.89N 112.73W
07/29/2016	M89 MPH	MARICOPA	AZ ASOS
GILA BEND AF AUX FIELD REPORTED WIND GUSTS OF 89 MPH. .			

&&

\$\$

AD

NWUS55 KPSR 300501

LSRPSR

PRELIMINARY LOCAL STORM REPORT

NATIONAL WEATHER SERVICE PHOENIX AZ

1001 PM MST FRI JUL 29 2016

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0800 PM	TSTM WND DMG	1 WNW SCOTTSDALE	33.50N 111.94W
07/29/2016		MARICOPA	AZ BROADCAST MEDIA
LOCAL MEDIA REPORTED AT POWER POLES DOWN. PICTURES ON SOCIAL MEDIA CONFIRMED AT LEAST ONE POLE KNOCKED DOWN. .			

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AD

APPENDIX C

NOTICE OF PUBLIC COMMENT PERIOD

**Request for Public Comments on Exceptional Events in the Maricopa County
(Greater Phoenix) PM₁₀ Nonattainment Area**

In 2005, Congress identified a need to account for events that result in exceedances of the National Ambient Air Quality Standards (NAAQS) that are exceptional in nature (e.g., not expected to reoccur or caused by acts of nature beyond man-made controls.) In response, EPA promulgated the Exceptional Events Rule (EER) to address exceptional events in 40 CFR Parts 50 and 51 on March 22, 2007 (72 FR 13560). On October 3, 2016, EPA released final revisions to the exceptional events rule. The EER allows for states and tribes to “flag” air quality monitoring data as an exceptional event. If flagged, these data can be excluded from consideration in air quality planning if EPA concurs with the demonstration submitted by the flagging agency documenting that all procedural and technical requirements have been met.

Pursuant to 40 CFR 50.14(c)(3)(i), the Arizona Department of Environmental Quality (ADEQ) is soliciting comments on its final demonstration of an event that has caused elevated concentrations of PM₁₀ in the Maricopa County (Greater Phoenix) PM₁₀ Nonattainment area on 4/25/16, 5/27/16, 7/29/16, 9/27/16, 9/28/16. ADEQ has decided to flag these episodes based on this analysis. A copy of the demonstration is available for review beginning Monday, 7/31/17, on the ADEQ website at <http://www.azdeq.gov/programs/air-quality-programs/natural-exceptional-events-demonstration>. Interested parties can submit written comments throughout the comment period which will end at 5:00 p.m. on Thursday, 8/31/17. Any comments received will be responded to and forwarded to EPA with the final demonstration.

Written comments should be addressed, faxed, or e-mailed to:

Air Assessment Section, Arizona Department of Environmental Quality, 1110 W. Washington Street, 3415-A, Phoenix, AZ 85007, E-mail: exceptionalevents@azdeq.gov.

In addition to being available on-line, a copy of the analysis is available for review, Monday through Friday, 8:30 a.m. to 4:30 p.m., at the [ADEQ Records Management Center](#), 1110 W. Washington St., Phoenix, AZ, 85007, Attn: Records Center, (602) 771-4380, e-mail: recordscenter@azdeq.gov.

To request an auxiliary aid or service for accessible communication, please contact (602) 771-2215 or at co2@azdeq.gov or dial 7-1-1 for TTY/TTD Services.

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AFFIDAVIT OF PUBLICATION

ADEQ

1110 W WASHINGTON

Phoenix, AZ 85007

Order # 0008709430 # of Affidavits 1

P.O. # ADSPO12-023863:508

Published Date(s):

07/31/17

STATE OF ARIZONA

COUNTY OF

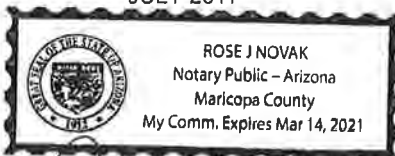
SS.

I, being first duly sworn, upon oath deposes and says: That I am the legal clerk of the Arizona Business Gazette, a newspaper of general circulation in the counties of Maricopa, Coconino, Pima and Pinal, in the State of Arizona, published weekly at Phoenix, Arizona, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates indicated

Sworn to before me this

31 ST day of

JULY 2017



Notary Public

Request for Public Comments on Exceptional Events in the Maricopa County (Greater Phoenix) PM10 Nonattainment Area

In 2005, Congress identified a need to account for events that result in exceedances of the National Ambient Air Quality Standards (NAAQS) that are exceptional in nature (e.g., not expected to reoccur or caused by acts of nature beyond man-made controls.) In response, EPA promulgated the Exceptional Events Rule (EER) to address exceptional events in 40 CFR Parts 50 and 51 on March 22, 2007 (72 FR 13560). On October 3, 2016, EPA released final revisions to the exceptional events rule. The EER allows for states and tribes to "flag" air quality monitoring data as an exceptional event. If flagged, these data can be excluded from consideration in air quality planning if EPA concurs with the demonstration submitted by the flagging agency documenting that all procedural and technical requirements have been met.

Pursuant to 40 CFR 50.14(c)(3)(i), the Arizona Department of Environmental Quality (ADEQ) is soliciting comments on its final demonstration of an event that has caused elevated concentrations of PM10 in the Maricopa County (Greater Phoenix) PM10 Nonattainment area on 4/25/16, 5/27/16, 7/29/16, 9/27/16, 9/28/16. ADEQ has decided to flag these episodes based on this analysis. A copy of the demonstration is available for review beginning Monday, 7/31/17, on the ADEQ website at www.azdeq.gov/environment/air/plan/nee.html. Interested parties can submit written comments throughout the comment period which will end at 5:00 p.m. on Thursday, 8/31/17. Any comments received will be responded to and forwarded to EPA with the final demonstration. Written comments should be addressed, faxed, or e-mailed to: Air Assessment Section, Arizona Department of Environmental Quality, 1110 W. Washington Street, 3415-A, Phoenix, AZ 85007. E-mail: exceptionalevents@azdeq.gov.

In addition to being available on-line, a copy of the analysis is available for review, Monday through Friday, 8:30 a.m. to 4:30 p.m., at the ADEQ Records Management Center, 1110 W.

Washington St., Phoenix,
AZ, 85007, Attn: Records
Center, (602) 771-4380, e-
-mail: recordscenter@azdeq
.gov.

To request an auxiliary aid
or service for accessible
communication, please con-
tact (602) 771-2215 or at co2
@azdeq.gov or dial 7-1-1 for
TTY/TTD Services.
Pub: July 31, 2017

APPENDIX D

EXCEPTIONAL EVENT INITIAL NOTIFICATION FORM

EE Initial Notification Summary Information

PM₁₀

Submitting Agency: Arizona Department of Environmental Quality

Agency Contact: **Jonny Malloy**

Date Submitted: **May 18, 2017**

Applicable NAAQS: **1987 PM₁₀**

Affected Regulatory Decision¹: **Maricopa County Non-Attainment**

(for classification decisions, specify level of the classification with/without EE concurrence)

Area Name/Designation Status: **Maricopa County – Phoenix (Serious)**

Design Value Period (list three year period): **2015-2017 and/or 2016-2018**

A) Information specific to each flagged monitor day that may be submitted to EPA in support of the affected regulatory decision listed above

Date of Event	Type of Event (high wind, volcano, wildfires/prescribed fire, other ²)	AQS Flag	Monitor AQS ID (and POC)	Monitor Name	Exceedance Concentration (with units)	Notes (e.g. event name, links to other events)
July 29, 2016	High Wind	RJ	04-013-4016-1	Zuni Hills	174 µg/m ³	State of Arizona Exceptional Event Documentation of a High Wind Dust Event PM10 Exceedance on July 29, 2016 in the Maricopa County PM10 Nonattainment Area

B) Violating Monitors Information

(listing of all violating monitors in the planning area, regardless of operating agency, and regardless of whether or not they are impacted by EEs)

Monitor (AQS ID and POC)	Design Value (<u>without</u> EPA concurrence on any of the events listed in table A above)	Design Value (<u>with</u> EPA concurrence on all events listed in table A above)

¹ designation, classification, attainment determination, attainment date extension, or finding of SIP inadequacy leading to SIP call

² Provide additional information for types of event described as "other"

C) Summary of Maximum Design Value (DV) Monitor Information (Effect of EPA Concurrence on Maximum Design Value Monitor Determination)

(Two highest values from Table B)

Maximum DV monitor (AQS ID and POC) <u>without</u> EPA concurrence on any of the events listed in table A above (2015-2017)	Design Value 0.66	Design Value Monitor Glendale (04-013-2001-1) and West 43rd (04-013-4009-1)	Note: The Glendale monitor exceedances are in the EE high wind submittal for Sept. 27-28, 2016.
Maximum DV monitor (AQS ID and POC) <u>with</u> EPA concurrence on all events listed in table A above (2015-2017)	Design Value 0.66	Design Value Monitor West 43rd (04-013-4009-1)	
Maximum DV monitor (AQS ID and POC) <u>without</u> EPA concurrence on any of the events listed in table A above (2016-2018)	Design Value 0.66	Design Value Monitor Glendale (04-013-2001-1) and West 43rd (04-013-4009-1)	Note: The Glendale monitor exceedances are in the EE high wind submittal for Sept. 27-28, 2016.
Maximum DV monitor (AQS ID and POC) <u>with</u> EPA concurrence on all events listed in table A above (2016-2018)	Design Value 0.66	Design Value Monitor West 43rd (04-013-4009-1)	

Note: The event in Table A is being submitted as an exceptional event demonstration due to the historical likelihood of additional high wind dust events occurring over the next few years. Subsequent initial notification forms may be submitted to EPA as documentation of the additional 2017-2018 events are pursued and prepared.